OCTOBER 1955

chemical processing

For Men who Manage

- Monsanto controls chemical waste disposal 14
- Ultra-fine-mesh screen by photoengraving 72
- Table of contents 4

Putman Publishing Company/Creators of Putman-Style
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Hercules Powder's
A. E. FORSTER
Pioneer of Progress
in oxidation processes
. . . see page 10

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Tires from rock and sand

Tires have always been made of rubber compounds, but now US Rubber Co. and Dow Corning have developed a tire in which silicone rubber and glass fibers have been combined successfully.

The new tire, designed for highly specialized uses, will withstand temperatures from minus 90 to plus 500°F. This makes such tires especially suitable for supersonic aircraft whose tires may be exposed to temperatures in the 400 to 500°F range . . . temperatures that would disintegrate ordinary aircraft tires.

Transparent insulation

When Dow Chemical Company in Midland, Mich., was starting up the Saran Wrap plant, a lot of waste Saran accumulated around the shop from test runs. Some of the Dow men were building homes at the time and used this waste as a vapor barrier in their houses simply by tacking it over exterior sheathing before siding was applied.

The results were excellent — no worries about peeling paint due to moisture escaping from within, since the transparent film is a perfect vapor barrier.

Only electricity utilized for heating in lab

Electricity only is being used for heating purposes in a laboratory recently opened by Enjay Co., Inc., in Linden, N.J. The lab is devoted to the technical side of petrochemicals marketing.

(*Continued on page* 267)

chemical processing

(CHEMICAL PROCESSING PREVIEW)

for men who manage

Vol. 18 October, 1955 No. 10

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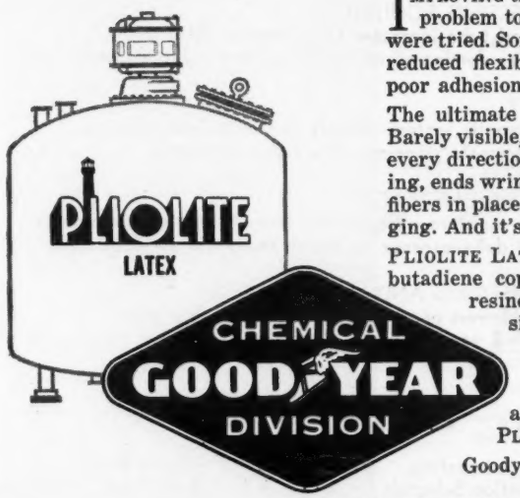
Now—liquid muscles for decorative fabrics!



IMPROVING the performance of decorative fabrics has long been a problem to their manufacturers. Many types of undercoatings were tried. Some improved strength and durability, but brittle feel, reduced flexibility and resilience, high cost, objectionable odor, poor adhesion and lack of permanence were added problems.

The ultimate solution was a coating based on PLIOLITE LATEX. Barely visible, this lightweight, odorless backing muscles fabrics in every direction, permits them to retain shape after severe stretching, ends wrinkling. It also improves body and drape and binds the fibers in place, increasing resistance to raveling, tearing and snagging. And it's permanent!

PLIOLITE LATEX is the family name for a series of styrene-butadiene copolymer dispersions, ranging from elastomeric to resinous in nature. These latices in the form of saturants, sizes, finishes, coatings, inks and adhesives are doing much to improve appearance and durability of textile, paper, leather and rubber products. What can you do with the strength, flexibility, permanence and resistance to chemicals, abrasion and aging of a PLIOLITE LATEX? For details, write:

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CHEMICAL PROCESSING • October, 1955 • volume 18 number 10

Over the editor's shoulder

We do it . . . . . and we're glad

Our traveling editor-engineers often ask our readers just what they think of CHEMICAL PROCESSING and how thoroughly the current issue has been read.

Mostly we find that not every word in every story in every section has been read . . . . not even in the reader's special field such as Corrosion or Instrumentation.

But we do find that every page has been *examined* — editorial and advertising — for ideas to use on the job. Many stories are not read — quick scanning of the headline and the explanatory picture (usually included) establishes whether more time is justified in reading the entire article. And we plan it that way!

Just keeping up with technical information these days can be a full-time job. Many companies assign a librarian to the task and hope short digests will alert the reader.

With reading time at such a premium, we try to trim out all the "deadwood". We use quickly-understood photos and diagrams to save your time. And we feel that you benefit by getting this information *firsthand*. Then, if you need more details, they're easy to get through our Reader Service Department.

We're glad to see our method of editing is saving time for the busy man in industry.

William C. Clarke

ASSISTANT EDITOR

- For more information on articles and advertisements in this issue, check the handy Reader Service slip opposite last page
- The product directory, pages 255 to 259, is your guide to all articles and advertisements
- To subscribe to this magazine, see reader-qualification form opposite last page

Highlights in this Issue

GUEST EDITORIAL
Expansion in the chemical industry — Dr. R. E. Hulse 6

PIONEERS OF PROGRESS
New chemical field: Phenols by oxidation 10

NEW SOLUTIONS OF PROCESSING PROBLEMS
Huge plant making ethylene for petrochemicals 12
Monsanto controls chemical waste disposal 14
Reusable glass block insulation cuts costs 16

MATERIALS
Makes closed- or open-cell vinyl structures 38
Flocculating agent speeds settling, filtration 40

IDEAS
Ultra-fine-mesh screen by photoengraving 72
First use of canned motor-pump for industry application 76

INSTRUMENTATION AND CONTROL
Controller keeps hammermills operating at full capacity 88
Uses orifice with by-pass to indicate flow 100

CORROSION CONTROL
Handling hot, corrosive vapors from phosphoric acid unit 106
Welded plastic exhaust ducts for caustic, pickling baths 110

MATERIAL HANDLING
How to handle molten phthalic anhydride 124
Pallet weighs only 28 lb — supports 1.5 ton 136

PACKAGING
Detergent filling increased by 200 units per minute 142

PROCESSING EQUIPMENT
Finned tube increases heat transfer 70% 150
Water demineralized by DC current, plastic membranes 156

SAFETY
Automatic system detects fire in incipient period 164
Allows safe opening of pressurized vessels 168

FOR THE LABORATORY
Cuts moisture analysis time from 12 hours to 5 minutes 176
Beat deliquescence — weigh sample in oven 178

ENGINEERING AND MAINTENANCE
Air blowers need no maintenance in four years 192
Vented vacuum pump eliminates condensed vapor problems 204

OTHER REGULAR FEATURES

That's Interesting 2
Convention Schedule 5
Guest Editorial 6
Highlights for Next Month 8
Chemical Expansion 68
Recent Books 140
Briefs from Other Magazines 190
New Literature 228
Engineering Data 248
Advertisers' Index 260

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THIS MONTH'S COVER

Pictured on the cover of this month's CHEMICAL PROCESSING are two members of the Hercules Powder Company team—President Al Forster and "Hercules" himself. They represent the group within Hercules which developed the partial oxidation techniques described starting on page 10.

Oct 3-5. Federation of Paint & Varnish Production Clubs, 33rd Annual Meeting, Hotel Statler, NYC.

Oct 3-5. 20th Paint Industries' Show, Hotel Statler, NYC.

Oct 9-13. The Electrochemical Society, Inc., William Penn Hotel, Pittsburgh.

Oct 14. American Institute of Chemical Engineers, Tenth Annual Meeting, South Texas Section, (with symposia on Air and Stream Pollution, Operations Research, etc, Galvez Hotel, Galveston, Texas.

Oct 13-14. The Society of the Plastics Industry, Inc., New England Section, Equinox House, Manchester, Vt.

Oct 17-21. National Metal Exposition, Convention Halls, Philadelphia.

Oct 17-21. National Safety Council, 43rd National Safety Congress & Exhibition, Chicago.

Oct 18-21. National Association of Corrosion Engineers, So. Central Regional Meeting, Shamrock-Hilton Hotel, Houston, Tex.

Oct 20. American Institute of Chemical Engineers, symposium on "Cost Estimation", "Chemical Treatment of Petroleum Fuels", "Unit Operations"; Hotel Statler, NYC.

Oct 25. Association of Consulting Chemists & Chemical Engineers, Forum & Annual Meeting, Belmont Plaza Hotel, NYC.

Oct 31-*Nov* 1. National Association of Suggestion Systems, 13th Annual Convention, Netherland Plaza Hotel, Cincinnati, Ohio.

Oct 31-*Nov* 2. National Paint, Varnish & Lacquer Association, Annual Convention, Shoreham and Sheraton-Park Hotels, Washington, D.C.

Oct 31-*Nov* 4. World Symposium on Applied Solar Energy, Univ. of Ariz., Tucson; and (Nov 1-4) Phoenix, Ariz.

Nov 14-15. Chemical Market Research Association, joint meeting with CCDA, Hotel Carter, Cleveland.

Nov 14-17. American Petroleum Institute, Annual Meeting, San Francisco.

Nov 14-17. Second International Automation Exposition, Navy Pier, Chicago.

Nov 27-30. American Institute of Chemical Engineers, Annual Meeting, Statler Hotel, Detroit.

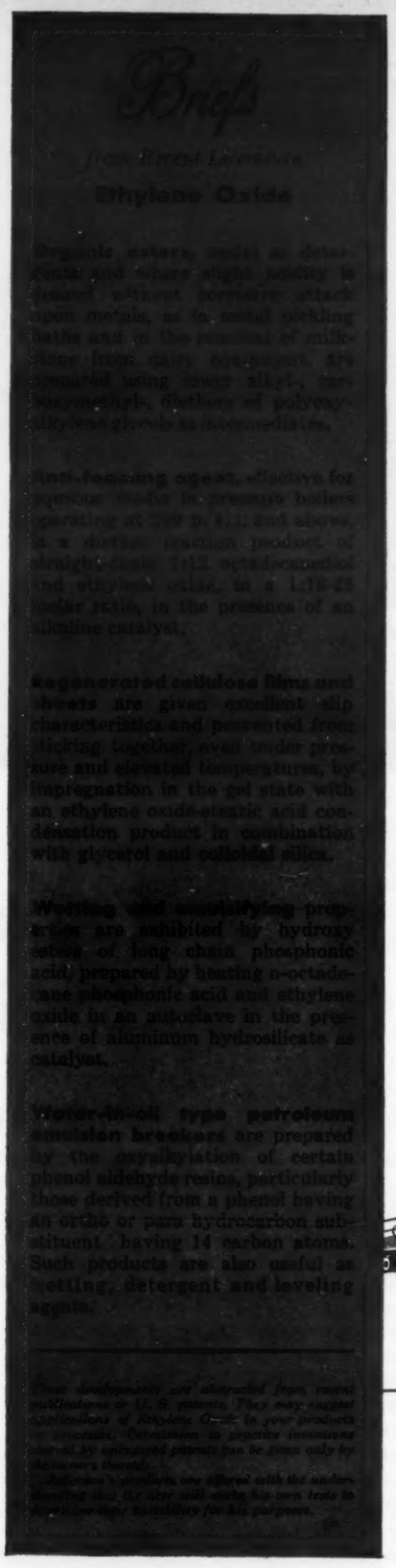
Dec 5-7. Chemical Specialties Manufacturers' Association, Annual Meeting, Roosevelt Hotel, NYC.

Dec 5-9. 25th Exposition of Chemical Industries, Commercial Museum & Convention Hall, Philadelphia.

Dec 6-7. The Society of the Plastics Industry, Sixth Film, Sheeting & Coated Fabrics Div. Conference, Hotel Commodore, NYC.

Dec 10-16. International Atomic Exposition, Public Auditorium, Cleveland.

Jan 18-20, 1956. Society of Plastics Engineers, Annual Conference, Hotel Statler, Cleveland.



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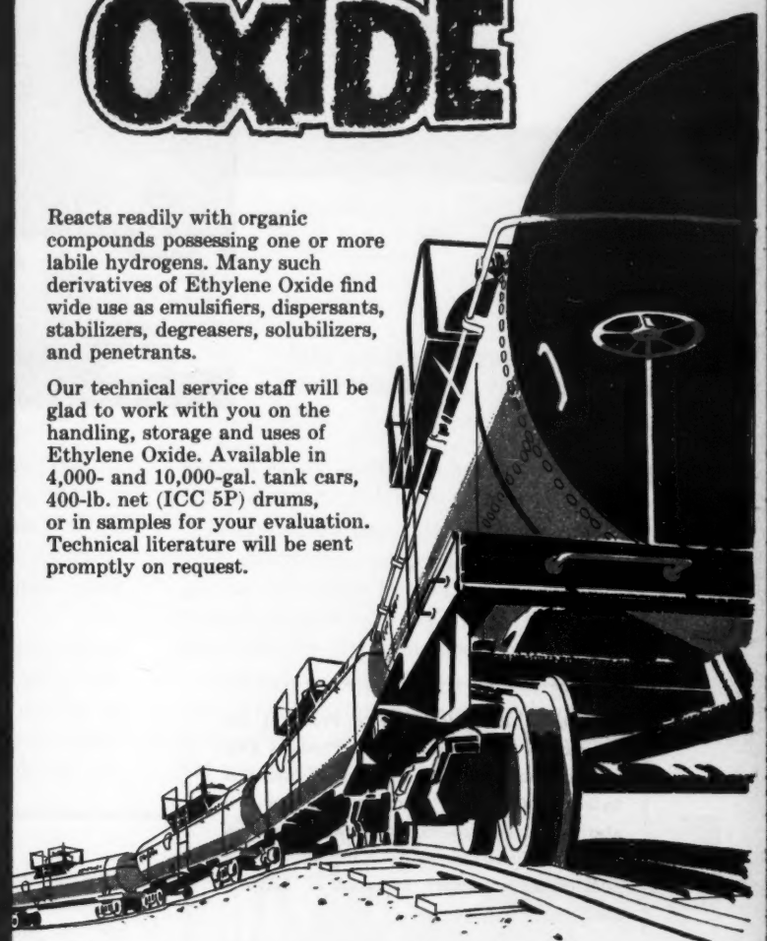

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Expansion in the chemical industry

DR. ROBERT E. HULSE

Vice President and Director
National Distillers Products Corporation

Dr. Robert E. Hulse is Vice President and Director of National Distillers Products Corporation and General Manager of the U.S. Industrial Chemicals Company Division. He also serves as Vice President and Director of National Petro-Chemicals Corporation, the 60%-owned subsidiary managed by National Distillers.

Dr. Hulse received his B.S. and M.S. degrees in chemistry from Rutgers and his PhD from Cornell University. He began his business career with Du Pont's Electro-Chemicals Department, where he became, in turn, Area Superintendent, Plant Superintendent, and Plant Manager. Dr. Hulse became associated with National in 1949 as Director of Research and Development and since that time has guided National to its present position as an established basic chemical producer.

Several methods are available by which a company can establish itself and expand within the chemical industry. It can buy its way by acquisition or merger. It can build new plants with know-how supplied by other chemical manufacturers or by engineering concerns. Or it can build new plants or expand existing ones from background information gained from its own research efforts. The method must depend upon the situation, for such factors as product demand, raw material supply, available capital, technical experience, relationship with existing company enterprises, and timing, must all enter into the decision of which is the proper path to profitable expansion.

The history of our own company, National Distillers Products Corporation, during the past seven years offers concrete examples of how a company can take advantage of each of these methods of expansion. And a look at the effects of some of these expansions gives closer insight as to why the chemical industry expands so rapidly.

When National's metallic sodium and chlorine plant was built in 1948-50, Ashtabula was chosen for the plant site for a number of reasons, one of which included the presence of a calcium carbide plant operated by the Electro-Metallurgical Company Division of Union Carbide & Carbon Corporation. Since

that time, Hooker-Detrex, Inc., has built an adjacent plant to produce chlorinated solvents from Carbide's acetylene and National's chlorine.

More recently, General Tire & Rubber Company has completed a polyvinyl chloride plant which combines by-product hydrochloric acid from Hooker's plant with acetylene from Carbide's plant. And across the road, Archer-Daniels-Midland Company has built a new plant which uses sodium in the manufacture of fatty alcohols. Part of their by-product caustic will be used in the other chemical plants.

Typical Growth

Electromet has recently announced plans for construction of a huge titanium plant to be completed at Ashtabula within the next 18 months. This plant will be the first to use sodium instead of magnesium for the production of titanium. National has already started to process a new high-purity grade sodium for use in the titanium program, using argon from Carbide's nearby Linde Air Products Company plant.

This growth of a large-scale integrated chemical industry in Ashtabula within a period of five years is typical of the chemical business. How many new plants will be located there 25 years from now is anyone's guess.

Tuscola, too, has experienced a tremendous chemical expansion. Where five years ago there was nothing but farm land, now there is the giant integrated "Petro" plant and the two allied U.S.I.-National Distillers plants. One fertilizer company has already started construction of a plant on an adjacent site and other relating enterprises are being considered. The total assets of the chemical industry at Tuscola have risen to over $75 million within less than four years. What the investment will be 25 years from now is again, anyone's guess.

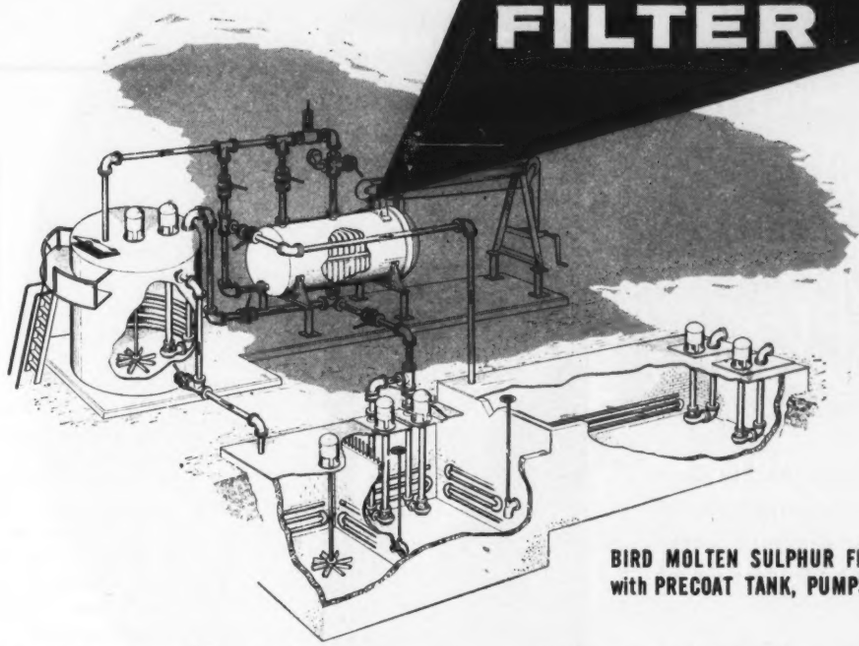
Various Techniques

In reviewing the various techniques of expansion which National has employed, one criterion has always been used: Growth by itself is only a secondary objective; the primary objective is to obtain an increase in earnings per unit of investment. National, in its expansion program, has frequently used the acquisition-merger route. But it has only used that route where activities dovetail, lead to greater efficiency, provide captive markets, or otherwise supplement each other. Where this did not apply, we have not hesitated to relinquish our holdings.

National has also made frequent use of purchased know-how. This method has the advantages of speeding up the investment process and compensating for insufficient experience, but it almost always places the producer in the position of a new entrant in a competitive market. In using this method of ex-

(*Continued on page* 247)

PRODUCTION "CATALYST"... the BIRD PRESSURE FILTER



BIRD MOLTEN SULPHUR FILTER SYSTEM with PRECOAT TANK, PUMPS AND PIPING

In manufacturing sulphuric acid, the presence of dirt in the molten sulphur causes frequent plant shutdowns for cleaning. Large settling tanks and other devices have not been able to reduce the impurities in the sulphur below 0.015 per cent ash content.

The system shown above completely solves the problem by removing the dirt before the sulphur is burned. The average ash content of sulphur delivered by the Bird Pressure Filter ranges from .001 per cent to .0005 per cent. Increased yearly production has resulted on all operations using sulphur filtration.

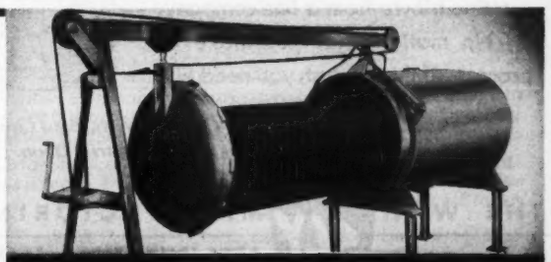
Minimum cycles of 24 hours are obtainable with this system, using one sq. ft. of filter area per ton of sulphur filtered. The operating costs are measured in fractions of a cent per ton of acid produced. One part time operator is all it takes.

Bird is prepared to engineer and furnish the complete filter station, including piping, pumps, feed metering devices, etc., for any given plant, for any given type of sulphur.

The high capacity and high efficiency of the Bird Pressure Filter are boosting production and lowering operating costs in a constantly growing number and variety of applications.

Bird engineers, with many years of experience in Pressure Filter design and application will be happy to tackle your filtration and clarification problems. A complete pilot-scale test plant backs them up with authentic pre-performance data.

Take advantage of these facilities — Write for full information.



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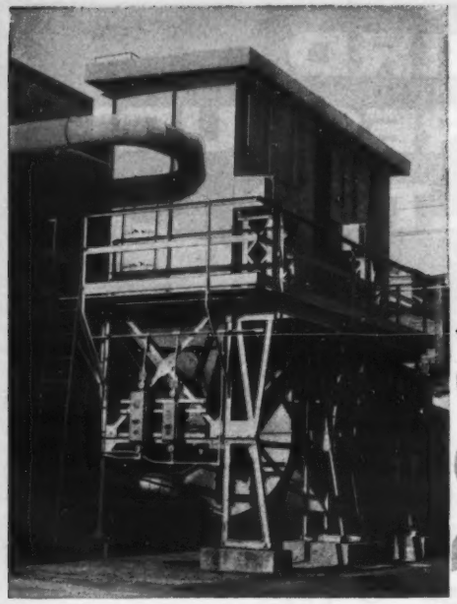
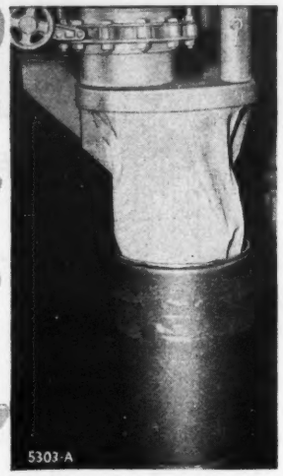


Sly Dust Filter at the plant of Merck & Co., Inc., Rahway, New Jersey.

SLY KEEPS VITAMIN PLANT DUST-FREE



Packaging Unit showing exhaust duct connected to Sly Dust Filter.

Merck & Co., Inc. uses Sly Dust Filters to maintain quality of product and manufacturing efficiency in the processing of vitamin mixtures.

The final ground powders are blended, milled, sifted and subdivided. Dust tends to escape from each operation. By the use of proper hooding of dust sources the dust is drawn into Sly Dust Collector. About 1.10 to 1.25 percent of each mixture is recovered and reused.

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what you can expect in next month's issue . . .

Chem Show Preview

The 25th Exposition of Chemical Industries is just a couple of months away. We figure you'll want to be making pre-show plans of what to see well ahead of time, so our November issue will feature a terse listing of what each exhibitor will display. This will give you five weeks to study the list befor the Show, plenty of time to lay-out an efficient, profitable browsing through the Philadelphia Commercial Museum and Convention Hall.

Looks like the Exposition will be a whopper—exhibitors will number close to 500 and will be showing the latest in materials, instruments, processing equipment, material handling devices. Show dates: December 5-9.

X-ray analysis assures true TV color

Magnetic tape for transcribing color television shows has to be of extremely high quality for good reproduction. It must catch frequencies as high as eight million cycles a second (compared to four million for black-and-white TV, twenty thousand for a good sound recorder). Key component in the tape is gamma-Fe_2O_3. Amount in tape is critical.

CP visited Minnesota Mining and Manufacturing Company recently to see how they meet this quality-control problem. Story told in a November "New Solutions" highlight reveals how X-ray diffraction is used for analysis of the gamma iron oxide. Dr. Walter E. Thatcher, Chemist with 3M's Central Research Department in St. Paul, worked closely with the CP staff in developing the story.

Eye dropper for solids

Feeding dry materials at rates of less than an ounce a minute is no easy job. Frequent solution is to put material into the form of a slurry of definite concentration and then feed the slurry at a set rate.

Johns-Manville, facing such a problem in feeding minute amounts of diatomaceous filter aids, skirted the slurry-mixing step. Key to their solution is a recently developed volumetric feeder which delivers solids with accuracies usually associated with liquid feeding. G. R. Bell, Senior Research Chemist at Johns-Manville's Research Center, tells how it's done in a November highlight article developed in collaboration with CP's editorial staff.

Electronic control — one year later

With more than a year of electronic operation behind them, F. C. Somers and R. C. Fuhs of Atlantic Refining Company review their experience in the next issue of CHEMICAL PROCESSING. Last January, CP carried the story (pages 76-77) of one of the two first fully electronic process control units, at Rock Island Refinery. This is the story of how the other one has worked.

Sample verdicts: Atlantic's objectives have been reached — operation is depend-

Here's a quick preview of features you'll find in November's Chemical Processing

able and accurate, system had fairly low first cost, personnel requirements are low, maintenance has been minimum. Particularly interesting to those who contemplate such systems — a rundown of what would be different if Atlantic had it to do again.

Para-xylene pumping

Associate Editor Weyermuller stopped by at Humble Oil & Refining Company (Baytown, Texas) a short while ago, and came across an interesting story of how they decant off para-xylene from sewer effluent.

Automatic vertical pump (above) raises the liquid from the sub-surface basin, gives no trouble despite volatility of the para-xylene. Of course, the whole system is explosion-proof.

This feature in the November "Engineering & Maintenance" section was worked out with H. M. Stewart, Engineering Associate with Humble Oil.

Compact urea plant

It's not always true that "good things come in small packages" . . . but the old saying does have a true ring when applied to the Pryor, Oklahoma, plant of Deere & Co.'s Grand River Chemical Division. There, a floor space of only 70 by 58 feet is needed for cooling, coating, conveying, and bagging 26,400 lb of urea prills an hour!

Works Manager W. W. Yeandle worked with CP Assistant Editor Frank McElroy in a "New Solutions" photo feature about the plant in the November issue.

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any WHERE

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Dimetcote is absolutely unique. It is not a paint, it contains no oils, resins or any other organic materials, yet it can be applied by spray or brush. When Dimetcote is applied to steel, a reaction takes place at the surface which produces chemical bonding as well as physical adhesion. It is almost impossible to find the interface between Dimetcote and the steel.

Dimetcote has many unusual characteristics. It shows no visible change after more than ten years exposure to the most severe weather conditions – sun, heat, fresh and salt water. It is insoluble in all solvents and petroleum products. It is highly abrasion resistant, but if abraded through to bare steel, the coating will cathodically inhibit corrosion.

Now tanks and structures can be given the same protection that galvanizing affords, *plus salt water resistance*. Existing structures need not be dismantled and new structures can be coated either before or after erection. *Only one coat* of Dimetcote over a sandblasted surface is required to protect such structures as:

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When inquiring check CP 1005 opposite last page

A. E. FORSTER

Willard Stewart photo

PAUL MAYFIELD

DR. EMIL OTT

DONALD H. SHEFFIELD

DR. R. S. GEORGE

DR. R. W. IVETT

DR. ERNEST TURK

DR. E. J. LORAND

Few chemical industries can boast a history as long as that of naval stores. Yet precisely in this old established field, Hercules Powder's research team has developed a new set of processes which will supply us with "twentieth century" chemicals.

PHENOLS | by OXIDATION

BY BRUCE FADER, ASSOCIATE EDITOR

Now supplying phenol, p-cresol, rubber catalysts and other materials, the oxidation techniques worked out by Hercules can be expected to produce hosts of hard-to-get and new chemicals and intermediates.

Naval stores were staple chemical products back in the days when wonder drugs were unknown, only natural fibers were used, and the word "synthetic" carried a taint of "inferior". In this country, Hercules Powder Company has been one of the prime suppliers of naval stores (rosin, turpentine, pine oil and monocyclic terpenes). And because of its solution to a long standing problem of the industry today, we are beginning to reap dividends in the field of wonder drugs, synthetic fibers, synthetic rubber, plastics and many other chemically-produced products.

What was this problem whose solution had such far reaching effects? It was the production of surplus monocyclic terpenes. When Hercules, or any other producer, extracted rosin and turpentine from pine stumps, monocyclics were also extracted. In the same sort of situation as caustic and chlorine producers, Hercules went to work to find what could be done.

Since it seemed that monocyclics could be directly oxidized with air to produce materials like pine oil, research, under R. S. George, turned to this problem. There was a ready market for the pine oil-like materials that could be used as flotation agents.

Blind Alley Leads To Success

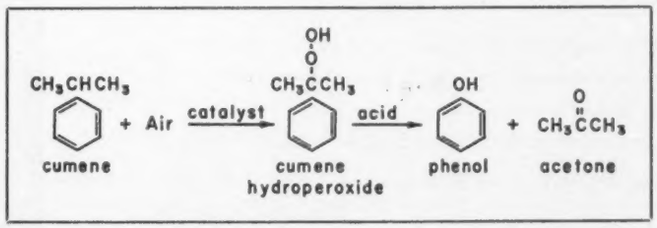
But while this work was in progress, market conditions changed . . . as they have a habit of doing. Demands of the company (it was 1943) changed the emphasis from pine oil for flotation to monocyclics themselves for rubber reclaiming. Results of this first research on direct oxidation were not particularly encouraging either.

However, this early oxidation work gave clues which were intriguing. Al Forster, then General Manager of the Naval Stores Department and now President of Hercules, and Paul Mayfield, now General Manager, took the active personal lead in making sure that these clues were actively investigated. Concurring in their hopes for success was Director of Research, Emil Ott, Naval Stores Department's Manager of Development, Don Sheffield, and R. S. George, Manager of Naval Stores Research.

One of the immediate results of this expanded interest was an investigation of chemicals similar to the terpenes. Cumene and cymene came under the guns of chemist E. J. Lorand. When he started work on oxidation of cumene (isopropylbenzene) it took 40 days to convert 35-40 per cent of the cumene to the primary product, cumene hydroperoxide. Much experimentation by Lorand and co-workers, J. E. Reese and J. C. Conner, Jr., under direction of George, disclosed conditions and methods to accomplish this in a few hours. More than any other single factor, this made production of hydroperoxides an enticing possibility. The stature of the project was increased from a laboratory trick to a commercial possibility.

Despite differences in names and sources, monocyclic terpenes, cumene and cymene have some similarities. In fact, cymene is produced from either monocyclic terpenes or toluene. All have six-membered rings as

(*Continued on page* 247)



Recent completion of second manufacturing unit at Gulf Oil's Port Arthur plant brings capacity of the world's largest producer to more than a million pounds a day of —

ethylene for petrochemicals

Extensive distribution facilities and dependable supply of the high-purity material offer incentive for chemical industries to move into area

By **GORDON WEYERMULLER,** Associate Editor
with **L. O. CROCKETT,** General Manager, Chemical Dept.
Gulf Oil Corporation, Pittsburgh, Pennsylvania

TOTAL capacity of the world's largest ethylene plant — that of Gulf Oil Corporation at Port Arthur, Texas — was increased to more than a million pounds a day when company's second manufacturing unit went on stream on July 14, 1955. Second unit increased capacity of plant by 220 million pounds a year.

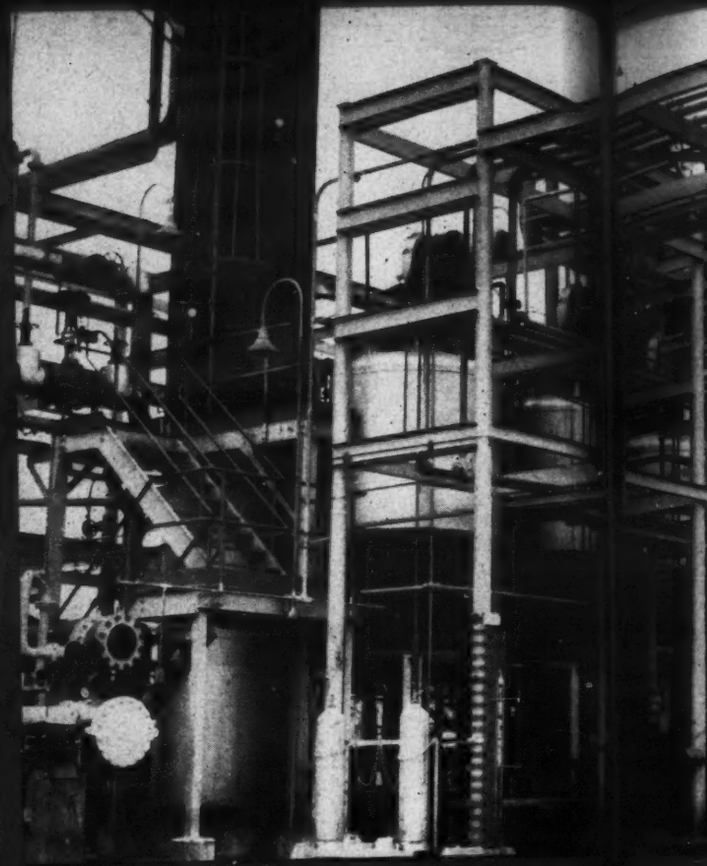
Although ethylene is a petrochemical itself, importance of the product is its use as the basic raw material for a host of other petrochemicals made in the Texas Gulf Coast area. Among chemicals made from ethylene at present are ethyl alcohol, ethyl chloride, ethylene glycol, polyethylene, tetraethyl lead, trichloroethylene, and many more. Although DuPont, Ethyl Corporation, Koppers, and Monsanto were the original four companies supplied, a number of others are now furnished ethylene from the Port Arthur facilities.

Increased supply of ethylene now available will not only benefit present customers, but will provide an incentive for other chemical plants to move into the area. Of particular advantage to industries in the Texas Gulf Coast area are the extensive storage and distribution facilities for ethylene. Material is handled in a pipeline extending from Port Arthur, Texas to Orange, to Houston and down to Texas City for a distance of more than 130 miles. Method of distribution and storage is quite flexible and affords a continuous and reliable supply of ethylene at all times.

One reason the supply of ethylene is dependable — in addition to the stable source of gas to be processed from Gulf's large refinery nearby — is that the ethylene plant and distribution facilities have been carefully designed to insure uninterrupted production and ample storage.

Manufacture of ethylene at Gulf involves three operational steps: formation,

(*Continued on page* 18)



They're catching fish just off the plant site at Texas City as —

Monsanto controls chemical waste disposal

Hydrogen cyanide, acrylonitrile, vinyl chloride, acetylene, and other byproducts are effectively removed from waste water and gases by the combination of stripping, chlorination, and incineration

By **GORDON WEYERMULLER**, Associate Editor
with **H. E. MORRIS**, Assoc. Director of Research
Monsanto Chemical Company, Plastics Division

Most convincing evidence of the success of Monsanto's waste disposal program at Texas City is that fish are being caught in the bay just off the plant site. This success has been achieved in spite of the fact that toxic hydrocyanic acid is one of the byproducts that has to be removed from 50,000 lb per hr of waste water going to the bay.

Tests conducted at the Texas Game, Fish and Oyster Commission Laboratory showed that fish deaths occurred in all concentrations of HCN above 0.05 ppm. HCN is completely removed and the other byproducts (such as acrylonitrile, vinyl chloride, acetylene, and caustic) reduced to a very low level by the combination of stripping, chlorination, and incineration used at the plant.

In addition to making waste water non-toxic, method also controls air pollution, preventing soot and gases from contaminating the atmosphere.

Although liquid byproducts and waste gases have been controlled since the plant went on stream in 1942, present waste disposal plant was placed in operation in January 1953. A number of methods of treating the waste were considered, including ozone. Present procedure was adopted since it is a

(*Continued on page* 19)

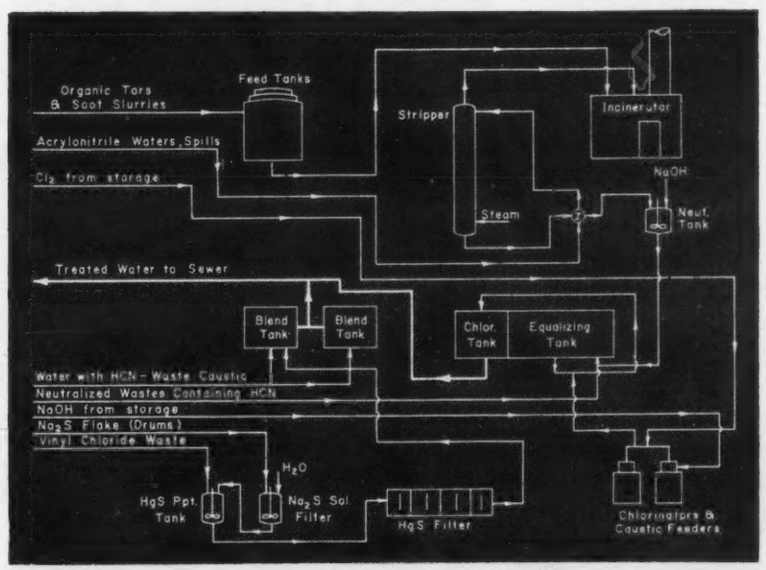
(*CP Staff Photos*)

HCN, waste caustic, and vinyl chloride byproduct are blended prior to chlorination (top, left)

Chlorine feed is automatically adjusted for complete removal of HCN (bot., left)

Waste nitriles go to incoming feed tanks and then are handled in stripper (top rt.)

Soot, high-boiling tars, and acrylonitrile residues are burned in incinerator (bot. rt.)



Monsanto's waste disposal plant

International Salt Company finds that *reusable* glass block insulation pays off during evaporator remodeling program. Product helps maintain top efficiency and . . .

cuts insulation costs

Blocks are rigid enough so that they can be removed and replaced whenever lines have to be relocated

Cellular glass block insulation not only helps maintain precise temperatures in vacuum evaporation process at International Salt Company, Inc., Watkins Glen, New York, but is paying off in other ways too. Currently approaching the end of a four year evaporator remodeling program, company has continued to maintain peak production by constantly shifting steam and other lines while necessary changes were being made. The glass block insulation is rigid enough so that it can be removed and replaced as lines are relocated. Reusability feature has saved company considerable expense. Conventional insulation would have peeled or chipped off, making it unfit for further use.

The two-inch glass blocks were pre-cut to proper size to fit the lines — some of which are 40 inches in diameter. Blocks were installed with strapping bands. No finish coating (asbestos cement covered with canvas skin) was applied if line was scheduled for relocation at later date. Insulation does not absorb moisture or brine and its insulation properties are permanent. Blocks are impervious to most acids, too. Material is composed of millions of tiny glass bubbles that contain trapped air and are sealed together into a continuous structure.

Company produces salt from brine concentrated in quadruple-effect evaporators. Brine is obtained by forcing lake water into a salt cavity 1200 ft below the surface. The saturated brine is processed at the rate of 12,000 gal per minute in the units, producing about 2.6 lb of salt for every 10 lb of brine.

All of the old evaporators have now been replaced. New units have an external heat exchanger on each effect for heating the brine. Old evaporators only had external heater on first effect and calandrias inside subsequent stages. Both heaters and evaporators are constructed of monel. Evaporators are 65¾ ft high and have a 15-ft-diameter center section. Each heater contains 1053 1¼ inch OD tubes measuring 26 feet long.

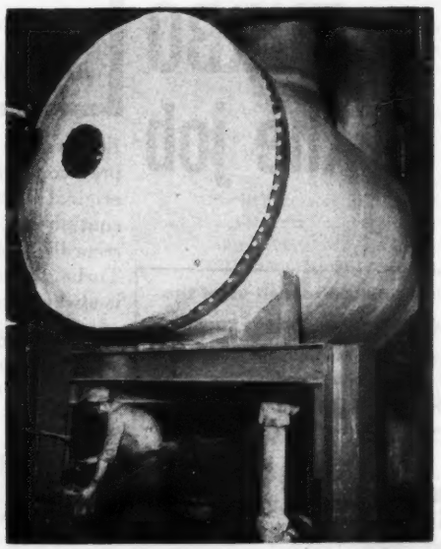
Maintaining proper balance between brine temperature and vapor pressure in the evaporators is critical factor of process. Brine is fed directly into the individual effects and does not circulate from one stage to the next. Salt crystallizes out and falls to bottom of each evaporator, where it is periodically removed and processed further. Steam driven off brine in first stage is used to heat brine in subsequent stages.

Proper insulation is extremely important since overall brine heating differential for the units is only 8°F. Thanks to effective insulation, heat losses are minimized and maximum utilization is achieved from 40,000 lb steam per hour used in the process.

(Foamglas insulation used on evaporators is product of Pittsburgh Corning Corporation, Dept. CP, One Gateway Center, Pittsburgh 22, Pa. . . . or for more information check CP 1006 on handy form opposite last page.)

(Evaporators are product of Swenson Evaporator Company, Division of Whiting Corporation, Dept. CP, 15669 Lathrop Avenue, Harvey, Ill. . . . or for more information check CP 1006A on handy form opposite last page.)

Evaporators used in process are 65¾ feet high, have 15-foot-diameter center section. Brine is processed in these evaporators at the rate of 12,000 gallons per minute



External heat exchangers, similar to the one above, heat brine entering each evaporator stage. Old evaporators only had external heat exchanger on first effect and calandrias inside subsequent stages

◀ Cellular glass block insulation on 40-inch vapor line helps maintain precise temperatures in quadruple-effect evaporator system

Turbo-Topics

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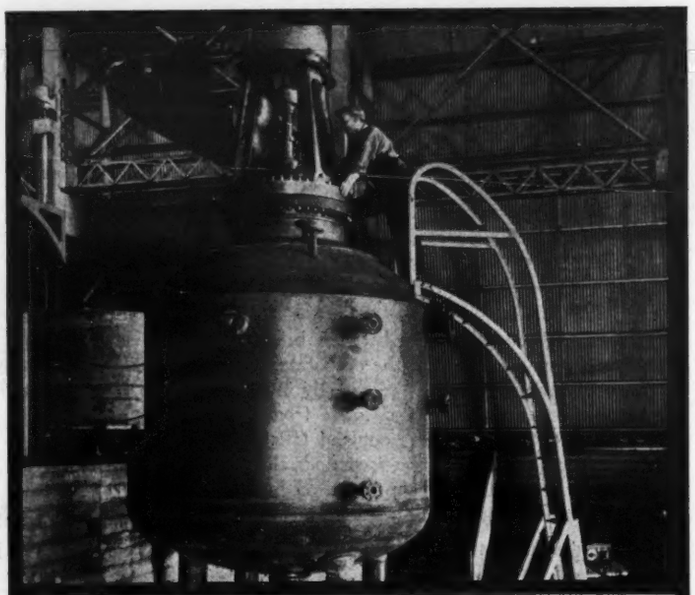

Turbo Contactor For Butane Isomerization: *furnished to C. F. Braun & Co., Engineers and Constructors as part of a plant built by them in 1942 for a West Coast petroleum processor.*

For over 25 years, Turbo has supplied leading oil companies with precision-built mixers for petroleum processing. In many plants, the original Turbos are still in operation—after more than 20 years of continuous 24-hour maintenance-free service. This outstanding service record is a testimonial to the rugged design built into each and every Turbo. If you have a process problem, call on Turbo. A Turbo engineer is always available to work with your engineers on request.

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NEW SOLUTIONS of processing problems

ETHYLENE

(*Continued from page* 12)

purification by elimination of minor contaminants, recovery and separation from methane and ethane. Ethylene is formed by dehydrogenation of ethane or by cracking of propane. Both reactions are achieved in cracking coils at temperatures around 1500°F.

In order to achieve the desired degree of purity, water, acetylene, sulfur, carbon dioxide, and some other contaminants are first removed. Ethylene is then separated from methane and ethane by fractionation. For this step, a cascade system of refrigeration is employed, in which ethylene and propane are used for cooling to obtain the sub-zero temperatures required.

(Second ethylene unit was designed and constructed by Stone & Webster Engineering Corp., Dept. CP, 90 Broad St., New York 4, N.Y.)

(For more information on ethylene contact Chemical Dept., Gulf Oil Corporation, Dept. CP, PO Box 1168, Pittsburgh 30, Pa. . . . or check CP 1008 on handy form opposite last page.)

✦ ✦ ✦

Are you wondering why many of these editorial articles give . . .

Manufacturer's Name and Address . . . ?

You doubtless have noted names and addresses of manufacturers at the end of editorial articles in CHEMICAL PROCESSING. Have you wondered, "Is this some sort of advertising?"

It isn't . . . that "source" is there because the editors know that often you want more information, quickly and easily. Of course, such articles are purely editorial material which has been selected by the editors as being worthy of your attention . . . (it is **not** carried with any responsibility to the manufacturer nor does it obligate the manufacturer). This is strictly a service for you . . . the reader.

We know that many readers often want more than just the pertinent description and facts . . so we tell you where and how you can obtain complete details, either by writing direct or using the handy Reader Service slip.

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THE EDITORS

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THIS TUBE-TURN* Welding Return has a bursting strength at least equal to that calculated for the seamless pipe with which it is recommended for use. Made in U.S.A., it meets all American Standard and Safety Code requirements. Welders everywhere know it will line up perfectly . . . because it's forged by the only process that produces a wall with the maximum uniformity of thickness and circularity. In short, when you specify "TUBE-TURN" you *know* you're right.

Your nearby Tube Turns' Distributor is at your service. He can simplify your planning, meet your requirements exactly, with industry's most complete line of welding fittings and flanges.

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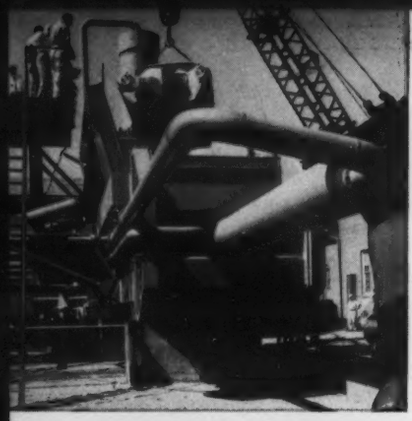
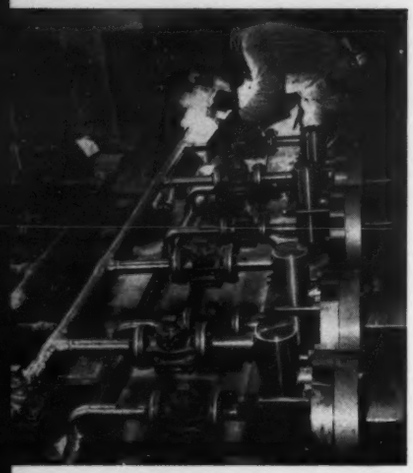
PIPING HELP





How TUBE TURNS' SERVICE can help simplify your piping jobs

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This unique press squeezes old automobiles into bales of metal to expedite scrap recovery. Designers of the press called on Tube Turns' Engineering Service for assistance in laying out the piping for the hydraulic system. Result—efficient, leakproof piping that enables the press to do its job on a two-minute cycle. Tube Turns' unmatched piping experience can help *you* when you have an out-of-the ordinary piping problem.

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TUBE TURNS

A DIVISION OF NATIONAL CYLINDER GAS COMPANY
LOUISVILLE 1, KENTUCKY

CHEMICAL WASTE DISPOSAL

(*Continued from page* 15)

sure method, it permits good control, and it will handle sludge.

HCN, waste caustic, and vinyl chloride byproduct are treated by precipitation, filtration, blending, and chlorination as indicated on lower part of accompanying flow chart.

Heart of the chlorination system is the oxidation-reduction potential recorder-controller, which automatically adjusts the rate of chlorine feed to produce the required treatment. The Monsanto plant was one of the first in the country to employ oxidation-reduction potential in control of cyanide wastes.

Chlorinators used are water diaphragm, vacuum types. Chlorine pressure reducing valve is operated by a pneumatic unit which is piloted by a float using the "water diaphragm" in the chlorinator bell jar. This arrangement results in extremely small metering variations. Valve of "fail safe" type and air switch minimize possible hazard.

Waste nitriles are handled in stripper. Bottoms from stripper are blended with cyanide waste water stream before chlorination. About 2000 gph is introduced into stripper at 0.01% acrylonitrile. This is reduced to 10-15 ppm in bottoms before chlorination. After chlorination, waste is diluted with sea water and sent to the bay.

Overhead from stripper passes to incinerator, where soot, high-boiling tars, acrylonitrile residues, and other byproducts are burned. Soot particles burned are extremely fine, being in the range of 10 to 20 Angstroms. Incinerator uses oil and natural gas for burning. Waste gases pass up 150-ft stack. An oxygen analyzer on top of stack, in addition to regular combustion control, assures removal of noxious products. Saran-lined piping is used throughout waste treatment plant wherever wet chlorine gas is handled. Very little maintenance has been required on any of the equipment used in the waste treatment plant.

(Series A-656 O-R Potential Controller and Series A-586 Solution Feed Chlorinator are products of Wallace & Tiernan Inc., Dept. CP, 25 Main St., Belleville, N. J. . . . or for more information check CP 1009 on handy form opposite last page.)

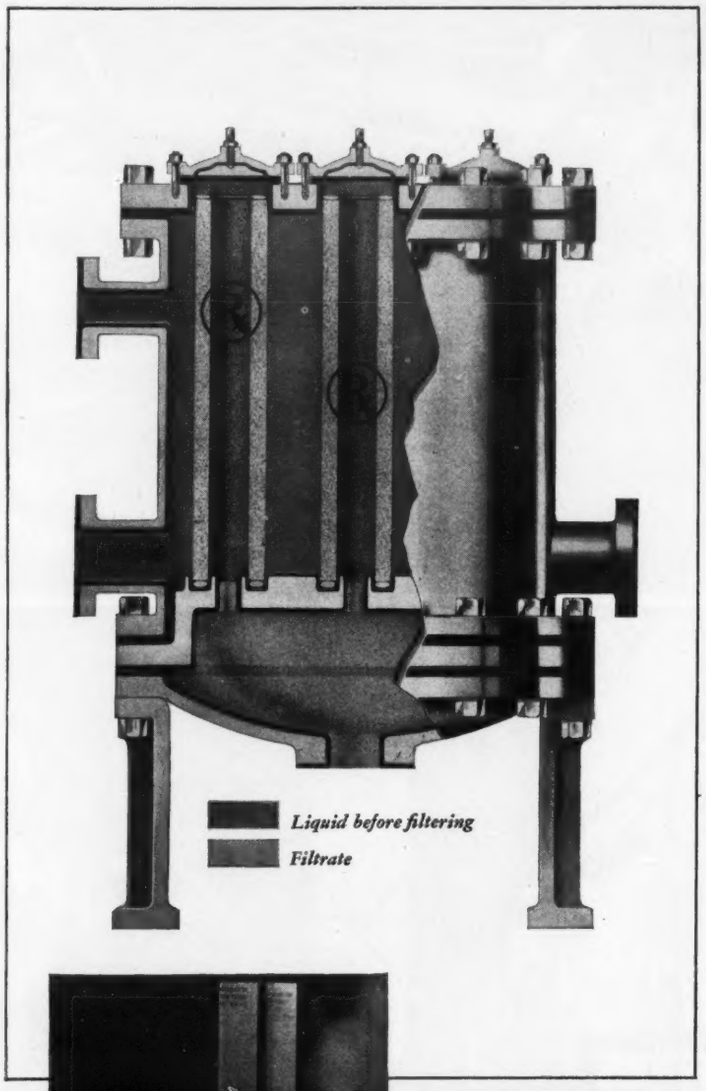
(Incinerator is product of Nichols Engineering & Research Corp., Dept. CP, 70 Pine St., New York 5, N. Y. . . . or for more information check 1009A on handy form opposite last page.)

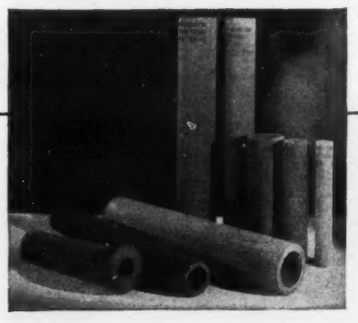
(For more information on saran-lined pipe, which is manufactured by The Dow Chemical Co., contact Saran Lined Pipe Co., Dept. CP, 2415 Burdette Ave., Ferndale 20, Mich. . . . or check CP 1009B on handy form opposite last page.)

For more information on product at left, specify CP 1010 . . . see information request blank opposite last page.

Another Norton Rx *on the job!*

Outstanding performance of Adams filters aided by Norton seamless porous tubes





R. P. Adams Co. Filters, covering many chemical filtering services, deliver sparkling clear filtrate and insure quick cleaning without disassembly. Adams filters handling acid or neutral solutions are equipped with Norton seamless porous tubes, *engineered and prescribed* for faster, more thorough filtering and backwashing.

Besides assuring fast, thorough filtering action, Norton porous tubes are extremely easy to clean by backwashing. Here are several good reasons why they excel in these two primary essentials of efficient, economical filter performance:

- Norton porous tubes are made of ALUNDUM* (fused alumina) *engineered* by Norton for chemical stability, inertness and other properties necessary to withstand acid, neutral and slightly alkaline liquors.
- Like all Norton ALUNDUM porous mediums they are made with the patented *controlled structure* process that assures even distribution of pores — for uniform passage of both filtering and backwashing liquids.
- They are *seamless,* providing unobstructed diffusion over their entire area — for further efficiency in both filtering and cleaning.

Other big advantages

of all Norton porous mediums include ease of installation and exceptional resistance to breakage and chipping. Available in sizes and open-pore ratios to meet your needs, they're *engineered* to last longer and cut your operating costs — and they're *prescribed* for a wide variety of chemical services, such as filtering water or solvents . . . cutting oils, wine, etc. . . . reclaiming cleaning fluids and industrial waste . . . and for boiler feed water treatment, carbonation, chlorination and other gas diffusion applications.

See your Norton Representative for further facts or write, describing your requirements, to NORTON COMPANY, 569 New Bond St., Worcester 6, Mass. *Canadian Representative:* A. P. Green Fire Brick Co., Ltd., Toronto, Ontario.

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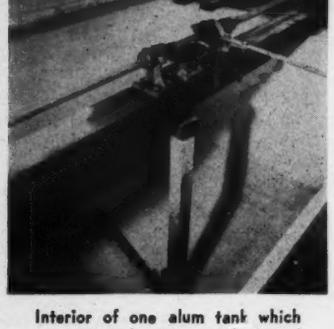
Celanese protects tanks by use of chlorinated rubber coating . . .

concrete no longer corroded by alum solution

Problem: Alum solution in storage tanks at Water Filter Plant, Celanese Corporation of America, Belvidere, N. J., was eating through the concrete walls of the tanks. This loosened the mortar in brick walls behind the storage tanks and caused leakage.



Interior of one alum tank which is protected with a chlorinated rubber coating

Solution: In 1953 tanks were coated with an enamel based on chlorinated rubber.

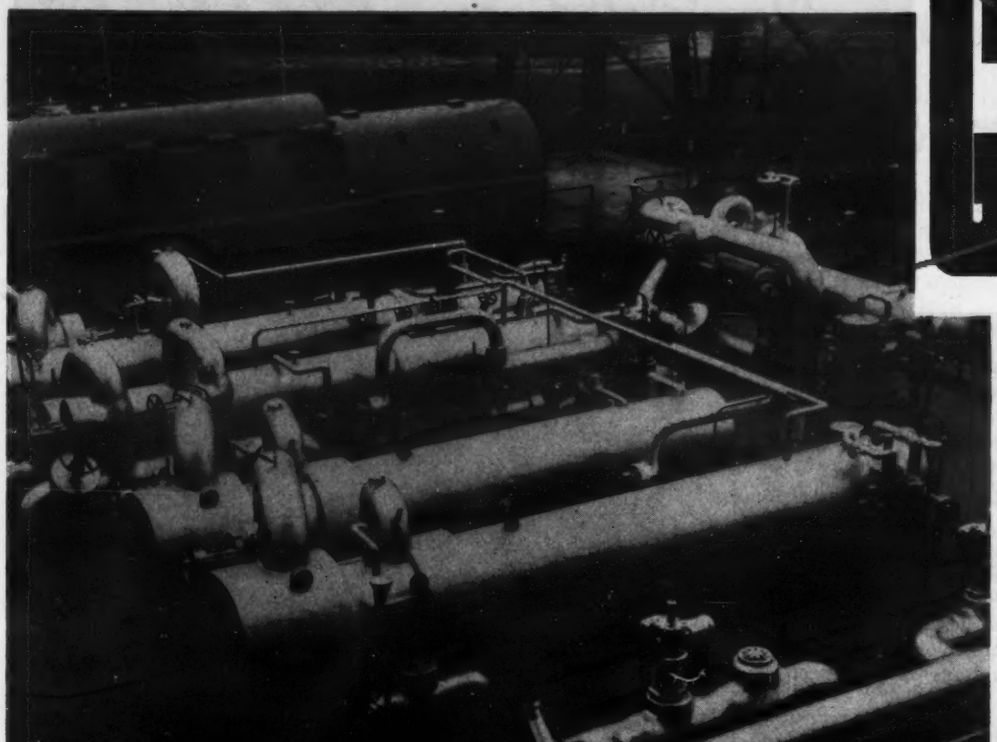
Results: Tanks have been fully protected for the two years the coating has been in service. Leakage has been eliminated and maintenance reduced.

(Torex chlorinated rubber coating is a product of Inertol Co., Inc., Dept. CP, 480 Frelinghuysen Ave., Newark 5, N. J. . . . or for more information reader may simply check CP 1012 on the convenient Reader Service slip opposite last page.)

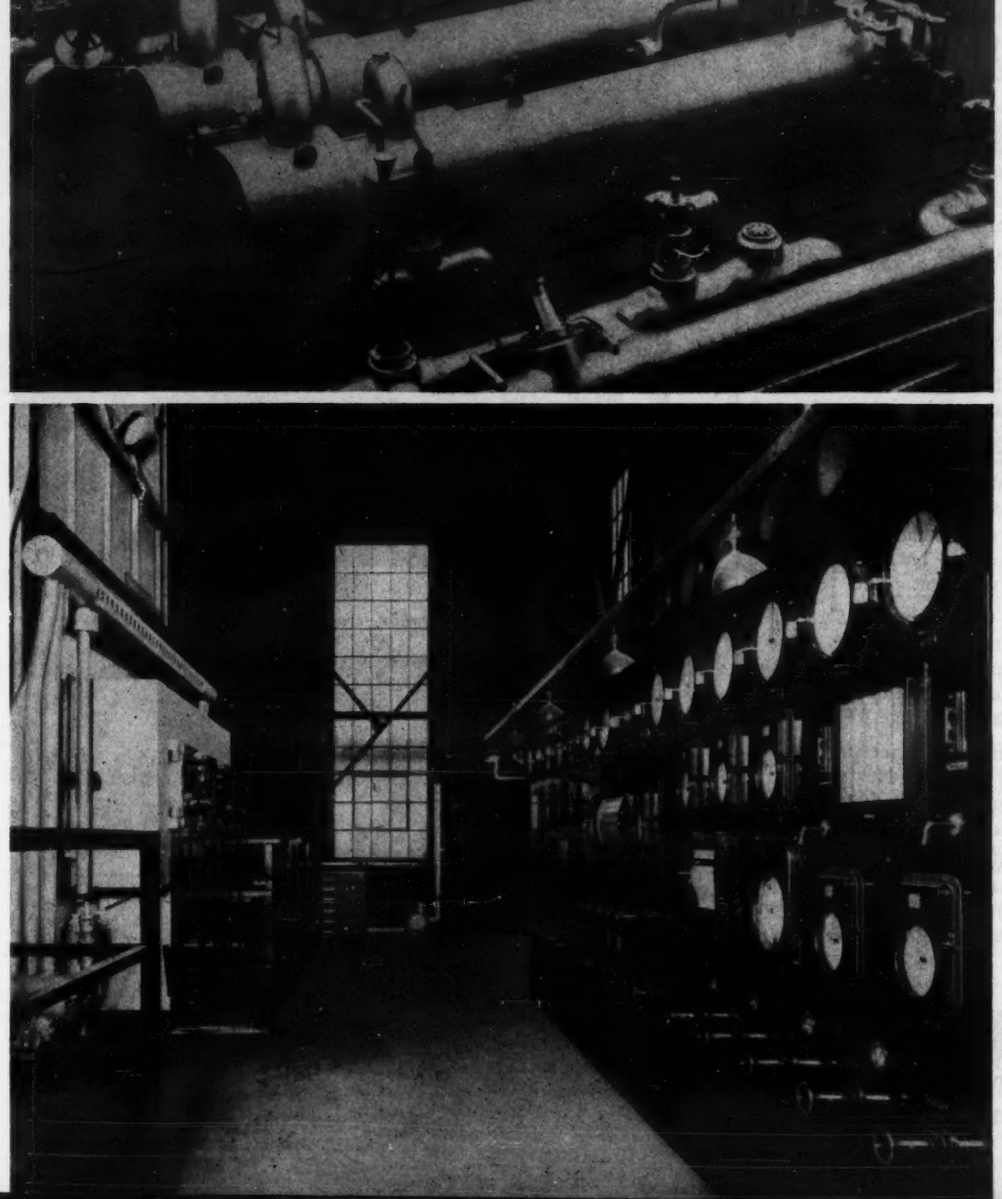
(Parlon chlorinated rubber on which Torex enamel is based is a product of Hercules Powder Co., Dept. CP, 940 Market St., Wilmington 99, Del. . . . or for more information about manufacturer's product reader may simply check CP 1012A on handy form opposite last page.)

One of a series telling how the producing companies of General Precision Equipment Corporation are contributing to America's progress.

GPE ....nd



Griscom-Russell feed water heaters in a 125,000 KW public-utility power station; save nearly 100 tons of coal per day. Heaters handle flow of water exceeding 2000 G.P.M. at 2500 pounds pressure and steam extracted from the turbine at five different points; "train" of five units preheats water fed to boilers from 90° F. to 441° F.



Askania multiple fuel boiler control panel in large steel plant; maintains metered proportion between combustion air and fuels—coke oven gas and fuel oil—for most economical combustion; holds steam pressure constant through all load changes and keeps furnace pressure at a safe and predetermined value.

General Precision Laboratory's Industrial TV Camera, the "Bullet"; portable, easily operated; used to monitor and improve manufacturing processes and to view hazardous industrial operations.

The highly advanced technological products designed and manufactured by the eighteen producing companies of General Precision Equipment Corporation serve more than a dozen major industries. Products of six of these GPE Companies—Griscom-Russell, Askania, Librascope, Link, Kearfott and General Precision Laboratory—have widespread application in the processing and power industries.

...ndustrial Processing...and Power

The Griscom-Russell Company is one of the country's largest producers in the fields of heat exchange and water distillation. It is the pioneer in heat exchanger equipment—the key to the whole complex of modern industrial processing and power. For over seventy years, G-R equipment has been responsible for greatly increased efficiency and lowered operating costs in industry.

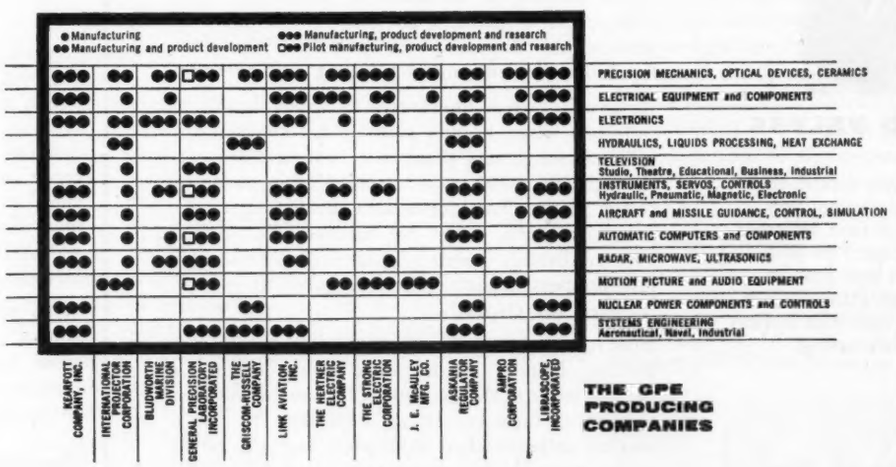
Askania Regulator Company for a quarter of a century has been a leading developer in the field of regulators and controls, including components and systems. Its products are widely used by the power, steel, gas and coke, mining, chemical, petroleum, glass and paper industries—wherever great reliability and accuracy are essential.

Kearfott Company, Inc.; Librascope, Incorporated; and Link Aviation, Inc. produce a wide variety of precision instruments, computers, servos and other control components for equipment and systems used throughout the power and the processing industries. Industrial television equipment manufactured by General Precision Laboratory Incorporated, the sixth GPE Company active in these fields, is playing increasingly important roles in "seeing eye" monitoring operations in these industries.

Each company in the GPE Group works in specific, highly specialized technical areas, as indicated in the chart below. Each of these companies, in addition to specializing in its particular products and fields of technical competence, has at its command, as required, the facilities and specialized techniques of the other GPE Companies in their respective fields. Interrelation is achieved through GPE's basic operating policy, Coordinated Precision Technology.

In the fields of research and development, GPE Coordinated Precision Technology permits a high degree of specialization in particular areas of competence and supplements such specialization by the application of techniques in other fields, as desirable. In the field of production, it makes possible a highly flexible application of facilities. This policy has been responsible for a diversified line of precision equipment of superior design and performance, covering a wide range of both standard and special uses.

Perhaps the most conspicuous advantage of GPE Coordinated Precision Technology is that the concept and development of equipment, and of solutions to the underlying technical problems, are not restricted or distorted by traditional allegiance to specialization in a particular field. GPE coordination permits the engineers and technical personnel of each GPE Company to seek the optimum solution for the customer within the total capacities of the GPE Companies as a group.



A brochure relative to GPE Coordinated Precision Technology and the work of the GPE Companies is available. Address your request, or inquiries on specific problems, to:

General Precision Equipment Corporation

92 GOLD STREET, NEW YORK 38, NEW YORK

When inquiring check CP 1013 opposite last page

Goodyear saves $72,000 per year in steam costs alone by use of dewatering method . . .

synerizing procedure cuts drying time in half for thermoplastic resin

Dewatering technique used at Goodyear Tire & Rubber Co. in drying of thermoplastic resins is providing considerable savings in a number of different areas. For example, procedure permits steam savings of $72,000 annually. In addition, $40,000 per year is saved in maintenance and cleaning. Method cuts drying time in half and permits one dryer to be used whereas two would otherwise be necessary. Effect produced is similar to that in colloidal gel systems known as syneresis.

COMPARISON OF DRYING TIME
BY SYNERESIS PROCESS AND ALL BY EVAPORATION

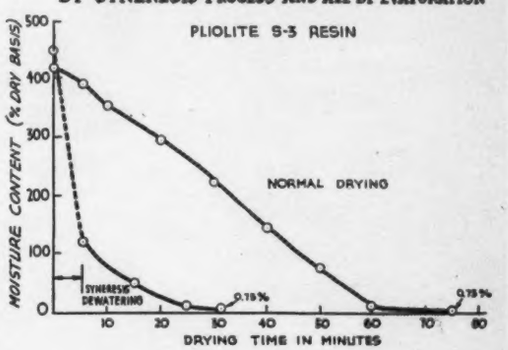


FIGURE 3

Method, which was first placed in operation in the Akron plant about six years ago, consists essentially of raising temperature of plastic to its softening point to break gel and allow a large portion of the water to be released suddenly. Moisture is further reduced by conventional drying.

Plastic being handled is a copolymer of butadiene and styrene, which is used as a rubber reinforcing compound. For this material a temperature of 165°F is used and a relative humidity of 75% is maintained.

At Goodyear, a section at one end of the dryer is used for the synerizing procedure. Wet material enters chamber on a slotted endless apron. Heat is introduced by a steam sparge above apron, releasing water to catch basin below.

Material enters the syneresis chamber at 400% moisture on a bone dry basis and leaves at 50% moisture. Conventional drying in remainder of dryer further reduces the moisture to 1.5% or less. In drying, material is uniformly distributed over a conveyor to a depth of 2 or 3" and heated air passed through the bed of material.

(Patent on drying method is held by the Goodyear Tire & Rubber Co., Dept. CP, 1144 E. Market St., Akron 6, Ohio. Check CP 1014 opposite last page.)

Impenetrable Sealing

HAMER BLINDS

are on the job at Richfield's Refinery

After testing their action in a trial installation, Richfield now uses Hamer Line Blinds extensively at its refinery at Watson as illustrated above.

HAMER *Visible Shut-off* LINE BLIND VALVES

HAMER *Plug Valves*

Thousands of users have proven the easy and immediate operation of Hamer Plug Valves. Will not stick or freeze.

Refinery operations require a valve that will provide a continual leakproof line shutoff. Hamer Blinds with their foolproof sealing action are unsurpassed for providing an absolute line seal that's both positive and permanent. In addition, Hamer Blinds fast, one minute, one man operation literally pay for their cost in downtime saving.

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HAMER VALVES, INC.

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Representatives throughout the World

When inquiring check CP 1015 opposite last page

NEW SOLUTIONS of processing problems

Collects pigment dust at source through hoods which shut off automatically . . .

Sherwin-Williams finds that a smaller collector can be used

Problem: Dusts from heavy metal oxides used in pigment paste grinding operations at Sherwin-Williams' Chicago plant were becoming noxious. A method of collecting these at point of origin was desired.

Solution: A dust control system employing local exhaust ventilation was installed. Hoods at batch-

(*CP Staff Photo*)

Operator batches titanium pigment into paste blender. With lid up, damper valve is open to dust collector. (Note second unit on floor where empty bags are piled)

ing points of the four paste blenders and also at place where floor sweepings are collected are designed to pass air at sufficient velocity to overcome effect of ambient air currents in the room that would disperse dust particles. Therefore hoods are very efficient in coralling dust particles.

Ductwork carries dust-laden air from hoods to collectors where heavier particles are knocked out by an impingement plate. Air is then drawn up through about 200 open-bottomed tubes, made of cotton sateen. Total filter area is 2585 sq ft. At preset intervals, tubes are mechanically shaken by a mechanism driven by 1-hp motor. Dust falls into hoppers beneath collecting tubes. It is then removed for disposal.

One feature of system is that after batching a blender, blender lid is pulled down, closing a damper valve in the ductwork. This avoids wasting ventilation capacity, makes it possible to use a smaller collector than otherwise, and also saves power costs. A Sturtevant blower rated at 7000 cfm at 6" wc, and powered by a 15-hp motor, is used with collector. Collector is designed for a 3:2-1.6:1 air-filter area ratio.

Unit has built-in plenum chamber, enabling it to

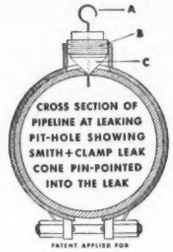
Safer . . .
Quicker . . .
Pipeline Repairs

Weld+Ends Permits Welding a Pipeline While Pumping Through It.

A pipeline safety welding coupling for crude oil, gas, gasoline, asphalt, steam, chemical process and other pipelines. WELD+ENDS joins pipe securely so flow can be resumed immediately at full pressure. Welding can be performed while pipeline is in use days or weeks later. Sizes 2" to 36".

• • •

Smith+Clamp Permits Plugging and Welding Pit-Hole Leaks in a Pipeline While Pumping Through It.


A
B
C
CROSS SECTION OF PIPELINE AT LEAKING PIT-HOLE SHOWING SMITH+CLAMP LEAK CONE PIN-POINTED INTO THE LEAK
PATENT APPLIED FOR

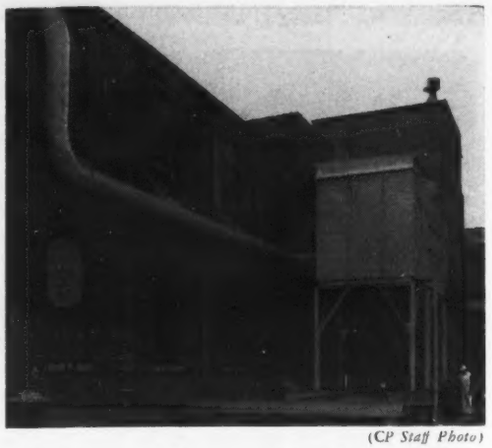
Smith+Clamp shuts off more easily, quickly and safely than ordinary clamps. Use on high and low pressure gas, gasoline, crude oil, water, steam, air, chemical process and other pipelines. Sizes 1" to 30". Combine with WELDPLATE when pipe reinforcement is specified.

Write today for complete information on these latest developments in safer, quicker pipeline repairs: Weld+Ends and Smith+Clamp.

The Pipe Line Development Co.

5700 Detroit Avenue Cleveland 2, Ohio

When inquiring check CP 1016 opposite last page



(*CP Staff Photo*)

Located on adjoining roof, dust collector is lightweight. Man stands by drums into which hoppers are emptied

operate efficiently under very heavy concentrations. Collector housing is made from 14-gage steel sheet, and is heavily braced.

Results: Cloth filtration unit has efficiency above 99% (by wt), even with particles in low micron range. Exhausted air presents no pollution problems when it is discharged into atmosphere. Collector itself is relatively light in weight, presented no problems when installed on roof of second floor.

(Model 112 Dustube collectors are products of Wheelabrator Corp., Dept. CP, Mishawaha, Ind. . . . or for more information check CP 1017 on handy form opposite last page.)

Grinder overfeeding eliminated, production increased, by use of vibrating feeders . . .

three mills now do work of four; feeders cut labor, maintenance costs

Problem: Overfeeding frequently choked-up mills and delayed production at Bibby and Sons, Ltd., Liverpool, England. Whenever this occurred, grinders had to be stopped, opened and cleaned, all of which was costly and time consuming.

Solution: Company installed an automatic feed-control system for the mills. Each grinder is fed by an electronically-controlled vibrating feeder. Current to motor driving grinder is sensed by a current transformer connected to a control unit. If grinder motor current falls below full load, the controller regulates a small geared reversing motor on the feeder and the rate of feed is increased. If motor current exceeds full load, feed rate is gradually decreased.

(*Continued on next page*)

Specify Lapp Auto-pneumatic PULSAFEEDER

. . . for Automatically Controlled Metering of Liquids

The outstanding features of the Lapp "Auto-Pneumatic" Pulsafeeder make possible continuous automatic processing of liquids which cannot be satisfactorily handled by plunger-type metering pumps. The "Auto-Pneumatic" Pulsafeeder is a piston-diaphragm pump providing positive displacement without the problems of a stuffing box. A hydraulically balanced Pulsafeeder diaphragm isolates the product from the working parts of the pump, preventing product leakage or contamination. With pneumatic instrument control, the pumping rate of the "Auto-Pneumatic" Pulsafeeder automatically adjusts from zero to full capacity. Manually adjustable models also available.

WRITE FOR BULLETIN 440 ***with typical applications, flow charts, description and specifications of models of various capacities and constructions. Inquiry Data Sheet included from which we can make specific engineering recommendation for your processing requirement. Write Lapp Insulator Co., Inc., Process Equipment Division, 482 Wilson Street, Le Roy, New York.***

Lapp

When inquiring check CP 1018 opposite last page

ACTIVATED CHARCOAL PROCESSOR INCREASES YIELD FROM 53% TO 76%

Single Pass Multiple Stage Milling Paid for Itself First Year!

By replacing a hammermill yielding 53% of usable product with a modern Allis-Chalmers two pair high roller mill, a charcoal processor increased his minus 10, plus 28-mesh screen yield to 76%.

Because of the increase in yield, this mill, operating with an Allis-Chalmers gyratory screen, *paid for itself in less than a year!*

This big increase was made possible by the *gentle* size reduction afforded by roller mill grinding. There is no excessive shattering and no size destroying impact. And, multiple stage grinding in roller mills minimizes fines.

To meet your varying requirements in chemical processing, Allis-Chalmers roller mills are built in one, two and three pair high models. Double and triple roller mills are used when no separation is necessary between reductions. Roll lengths range from 18 to 42 inches in 9 and 10-inch diameters.

For complete information on roller mills and other equipment for your industry, call your A-C representative or write Allis-Chalmers, Milwaukee 1, Wis.

A-4596

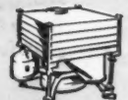
Other Processing Equipment for the Chemical Industry

Grinding Mills

Kilns, Dryers, Coolers

Vibrating Screens

Compacting Mills

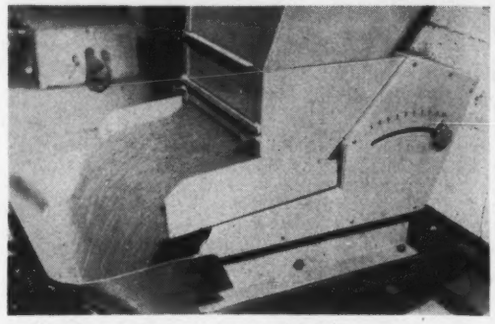

Gyratory Screens

Man-Lifts

ALLIS-CHALMERS

When inquiring check CP 1019 opposite last page

(*Continued from preceding page*)



Vibrating feeder can be regulated to produce amplitudes from 3/16" down to zero

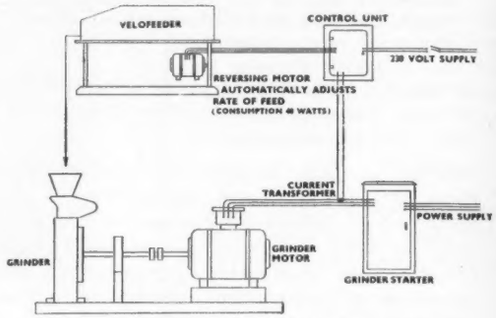


Diagram shows automatic feed-control system

Feeders are powered by a 1/8-hp motor that can be regulated to produce amplitudes from 3/16" down to zero. Conveying rate at maximum amplitude is about 70 fpm.

Results: By maintaining optimum flow of feed at all times, feeders have eliminated the overfeeding problem entirely. Output has increased so that only three grinders are now required — instead of four machines formerly needed. Other advantages realized include saving in labor costs, increased motor efficiency, less maintenance.

(Velofeeders are product of Richardson Scale Company, Dept. CP, Van Houten Avenue, Clifton, N. J. . . . or check CP 1020 opposite last page.)

Chemical cleaning program ends unscheduled shut-downs

How preventive-maintenance chemical-cleaning program eliminated unscheduled power-house shut-downs and prevented losses in production is told in illustrated two-page bulletin.

Bul on power-house equipment cleaning program is issued by Dowell Incorporated, Dept. CP, P.O. Box 536, Tulsa 1, Oklahoma. When inquiring specify CP 1021 opposite last page.

Replaces individual 100-lb containers, with single container holding 1940 lb . . .

telescopic bulk pack holds 180 slabs of wax, cuts material handling cost problems

Problem: At the Cit-Con Oil Corporation, Lake Charles, La., shipping Pacemaker Wax in individual 100 lb containers meant time-consuming stacking and high labor costs. It was felt that an improved method of material handling could be developed by going to bulk packaging.

Solution: A telescopic bulk pack holding 180 slabs of wax with a net weight of approximately 1940 lb was developed. This package made use of an expendable wooden pallet which was made an integral part of the package by means of steel strapping.

Results: With this bulk method of shipping it was found that combined package and pallet cost is lower per pound of wax shipped than for any

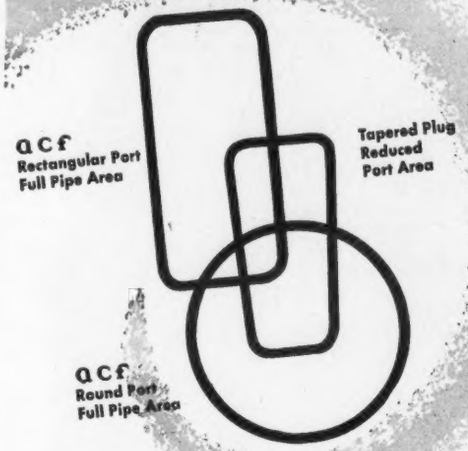
Single container holding 1940 lb replaces individual 100 lb containers to make shipping and handling simpler and faster

other package handled in the plant. Carloading was greatly simplified since one man on a fork truck can load a car in a short time. Twenty-four pallets are loaded in a 40 ft car, 28 in a 50 ft car, and by double-decking, 44 in a 50 ft "DF" car.

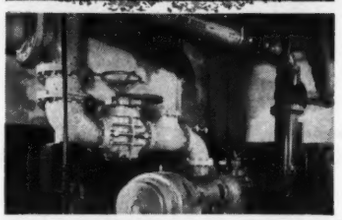
Also the one ton units are finding favor with customers because they allow efficient stacking and provide savings in storage space. Time and disposal problems are also solved by handling a single bulk container instead of many small units.

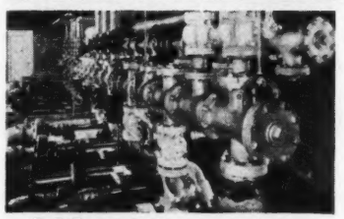
(Container was developed by Gaylord Container Corp., Dept. CP, 111 N. 4th St., St. Louis 2, Mo. . . . or for more information check CP 1022 on handy form opposite last page.)

BEFORE YOU BUY ANOTHER PLUG VALVE...



COMPARE THE PORT OPENINGS!





acf Plug Valves are backed up by Proof-of-Performance in every Processing Industry!

Turbulence! Loss of head pressure! These can present real problems when handling slurries and other viscous liquids! And because they are ordinarily the result of valves with "funnel action"...it pays you to make sure that the port opening has the same area as the pipe itself!

Pipe-matching port openings! This is only one of the reasons why more processing engineers than ever before are swinging over to acf Round Port Valves and Rectangular Port Valves. Other features, such as split-second, quarter-turn shut off...specially designed TEFLON* GASKET to prevent head leakage...all add up to lower maintenance costs and fewer work stoppages.

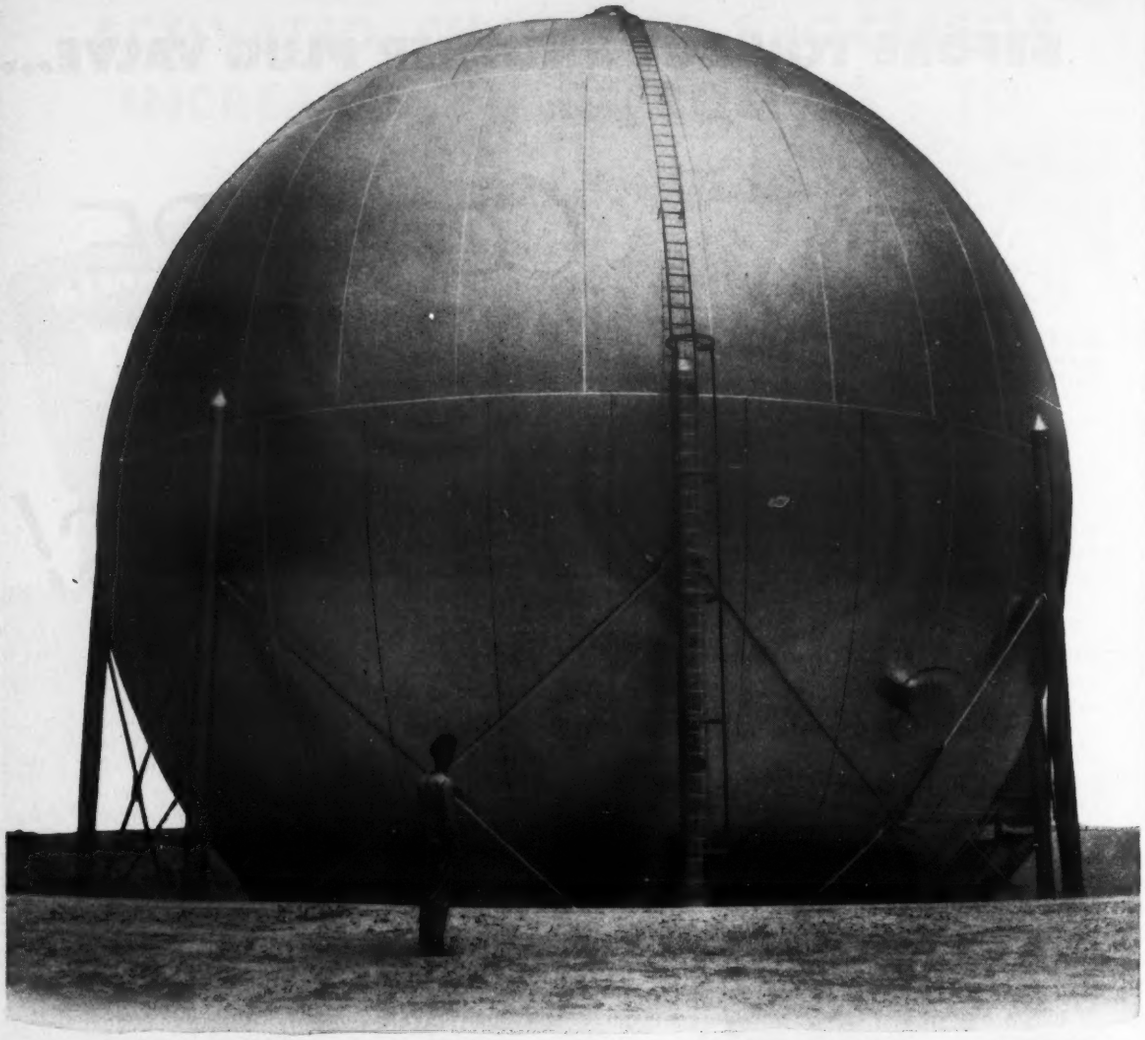
WRITE TODAY for descriptive Catalog E-8, acf Industries, Incorporated, Valve Division, 1501 E. Ferry Avenue, Detroit 11, Michigan

GET YOUR COPY of the acf Lube Manual, a complete description of lubricants and service recommendations. Ask for Manual No. 3.

*DuPont Tradename

acf CYLINDRICAL FULL PIPE AREA **PLUG VALVES**

When inquiring check CP 1023 opposite last page



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The above true sphere, the largest of its kind in the U.S., is an important element in a vital research project.

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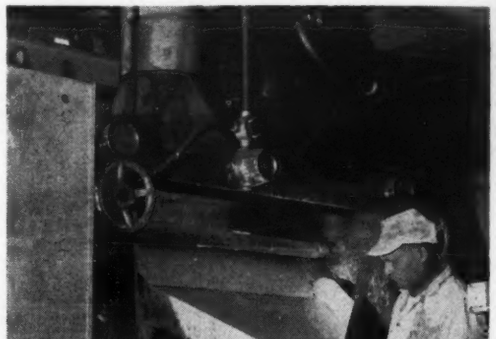
When inquiring check CP 1024 opposite last page

Pigment base dispersed in vehicle efficiently and completely by three-roll pallet mill

Problem: Making high quality paints and enamels at a large midwestern paint manufacturing plant requires efficient and complete dispersion of pigment base in vehicle. In addition, company wanted highest capacity commensurate with quality. They also required that mill be adaptable to both hard-and easy-to-grind materials.

Solution: Two vertical three-roll paint mills were installed in plant. The mills each have four gages to indicate pressures at each end of the slow and fast rolls. Gages aid in setting and equalizing roll pressures. Max roll pressures used are in 10,000-12,000 pound range.

Doctor blade pressure is regulated through air valve to give uniform pressure at predetermined setting throughout run. Blade has 45° bevel.



(CP Staff Photo)

Operator checks paint dispersion as mill starts up

Interesting feature on these mills is that they have cooling water inlet and outlet thermometers. By adjusting valves for each roll, spent cooling water can be kept at 70-80°F. Advantages are that method controls tack, and eliminates one variable between batches. It also conserves water and gives uniformity of grind at lower roll pressure settings and thus improves production rates.

Results: Mill capacity is high, reducing unit costs. Up to about 1200 gal (extended-basis) of enamel per hour is efficiently dispersed. All requirements have been met satisfactorily.

(Model 631-V three-roll paint mill is a product of J. M. Lehmann Co., Inc., Dept. CP, 550 New York Ave., Lyndhurst, N. J. . . . or for more information check CP 1025 opposite last page.)

Product purity of starch maintained through use of magnetic trap . . .

also prevents possible damage to pump gears

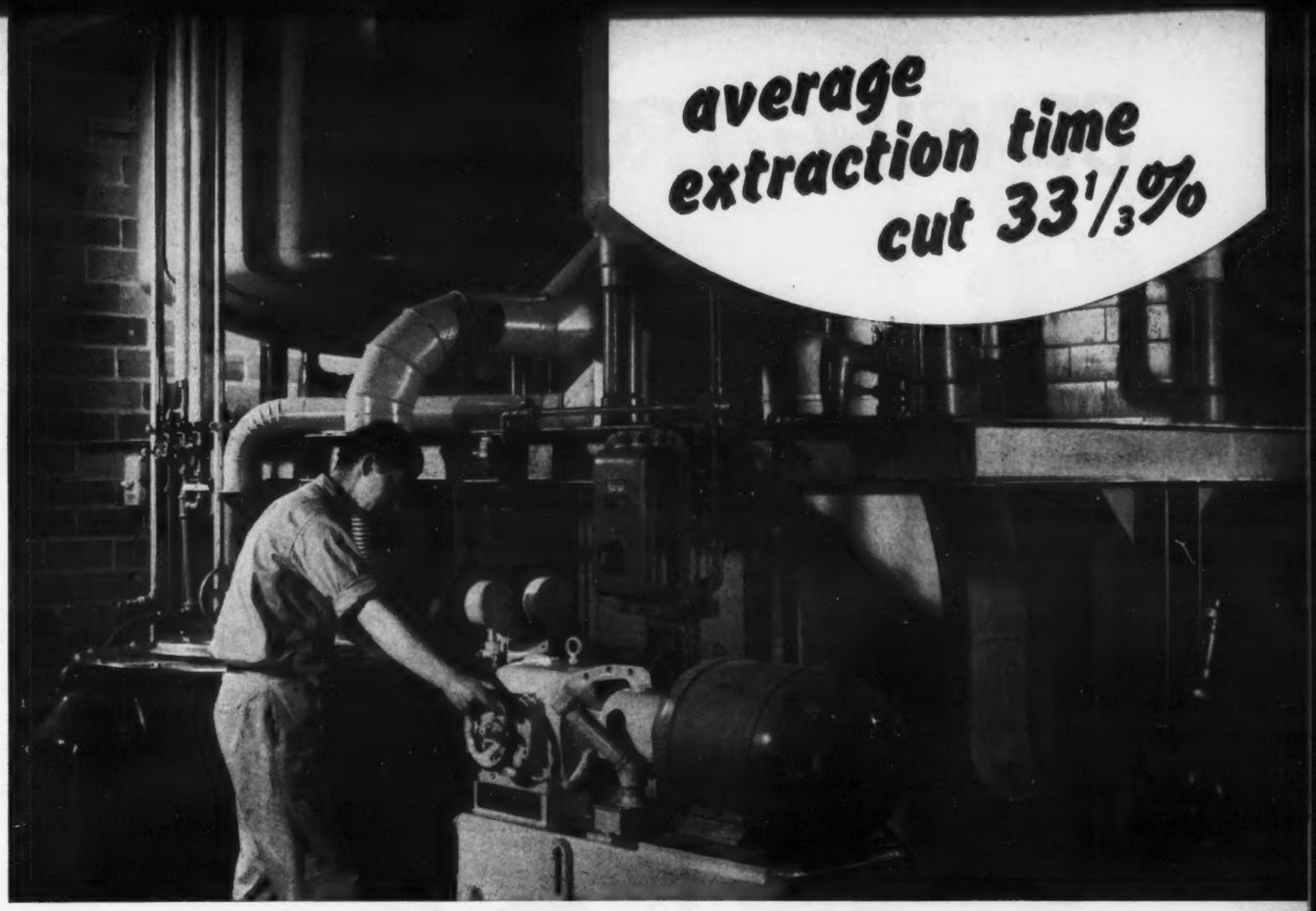
In the manufacture of liquid starch at Zippy Products, Inc., Lansdowne, Pa., high product purity is maintained by the installation of a magnetic trap in line just ahead of a close-tolerance pump used in filling operation. Magnetic trap not only protects the product from ferrous contamination, but also keeps pump gears from being damaged by pieces of metal that might possibly be in the raw material.

Magnetic trap is installed directly in starch line just ahead of a close tolerance pump used in filling operation

Magnetic trap is non-electric. As product enters line, it is diverted downward toward magnet by a baffle. Trap is designed for low pressures and ease of cleaning. It has done a satisfactory job since placed in service in May 1954.

(Cesco magnetic trap is product of Columbia Engineering Service Company, Department CP, 4025-37 Sebastopol Highway, Santa Rosa, California. . . . or for more information concerning the manufacturer's product, reader may simply specify CP 1026 on the convenient Reader Service slip which is located opposite last page.)

For more information on product at right, specify CP 1027 . . . see information request blank opposite last page.



Once more the ANY-SPEED Oilgear Drive betters machine performance "painlessly"

Many times in our experience the performance of an already highly efficient machine has been bettered without redesign, solely by changing the drive. One case out of many *varied* cases, is the Tolhurst Centrifugal pictured above, located in a great pharmaceutical house. This centrifugal was originally equipped with a two-speed electric motor drive. However the chemicals it is called upon to handle have widely varying crystal packing characteristics. Some of these crystals packed so densely at the speed available, extraction was inhibited, extraction time far out of balance and crystal removal difficult.

A change was made to an *"ANY-SPEED"* Oilgear Fluid Power Drive. Now the operator is able to shade the speed of the centrifuge experimentally—*and easily discover* the *best* speed for each batch of crystals.

As a result, extracting that used to take from 6 to 9 hours was cut to 4 to 6 hours. The extremely slow speed also available made unloading a great deal easier. This user now has several other Oilgear drives including one on a laboratory centrifuge.

There is very often a direct efficiency coefficient between machine operating speed and the type of work being handled. And we can cite many widely varying instances where equally dramatic and profitable gains resulted at once from a simple change to *"ANY-SPEED"* Oilgear Fluid Power Drives. If you want some interesting factual data on Oilgear's steplessly variable speed drives, their outstanding responsiveness to control impulses, their smooth acceleration and deceleration, talk to an Oilgear Engineering Representative. His mature and sound engineering recommendations may profit you greatly. THE OILGEAR COMPANY, 1583 W. Pierce St., Milwaukee 4, Wisconsin.

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BEARING TROUBLES?

NO SIR! Not with new
Reliance Motors and
METERMATIC • • • • the
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I found out how to put an end to burned out bearings from the Reliance Metermatic Bulletin, A-2406. Why don't you write for one? A-1499
New
Grease
RELIANCE ELECTRIC AND ENGINEERING CO.
Cleveland 10, Ohio • Offices in Principal Cities

When inquiring check CP 1028 opposite last page

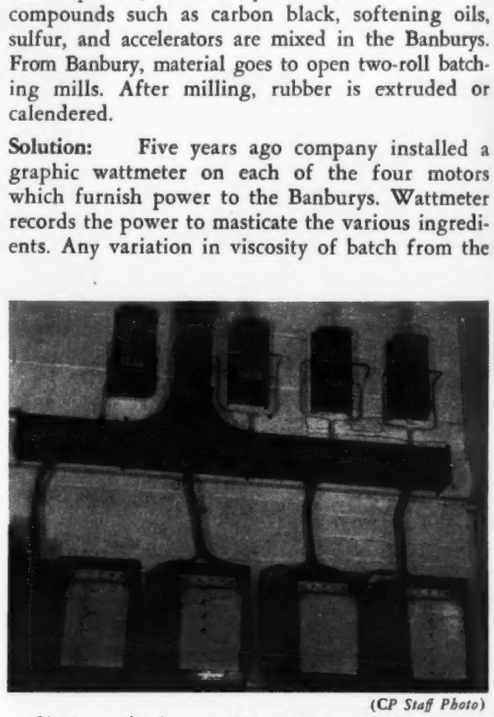
Ohio Rubber lowers rejections by use of graphic wattmeters on Banbury mixers . . .

instruments record variations in processing and adding of ingredients

Problem: Not enough information on the characteristics of each batch of rubber was provided by instrumentation on four Banbury mixers in use at The Ohio Rubber Company, Willoughby, Ohio. Temperature of each batch and the number of batches were automatically recorded. However, since slight variations in processing could cause rejects, a better method of measuring performance was required in order to lower the number of rejects.

In the process, crude or synthetic rubber and other compounds such as carbon black, softening oils, sulfur, and accelerators are mixed in the Banburys. From Banbury, material goes to open two-roll batching mills. After milling, rubber is extruded or calendered.

Solution: Five years ago company installed a graphic wattmeter on each of the four motors which furnish power to the Banburys. Wattmeter records the power to masticate the various ingredients. Any variation in viscosity of batch from the



(*CP Staff Photo*)

Charts on the four graphic wattmeters which record operating characteristics of each batch

standard during a given portion of a cycle can be easily noted. Record shows the exact time at which each ingredient was added, the total mixing time, and to a degree, any departure from the mixing specification.

In addition, each wattmeter has two chronograph pens, one writing in each margin of the chart. Left hand auxiliary pen records the raising and lowering of the Banbury mixer ram, which forces material against the rolls. Right hand pen records dump gate which discharges batch.

Results: Wattmeters have helped to lower re-

(*Continued on page* 30)

Cities Service refinery uses polyethylene tape to protect piping . . .

also prevents thread corrosion on concrete anchor bolts

At the Lake Charles, La. refinery of Cities Service Refining Corp., polyethylene tape has been used to protect underground piping. Tape, which has been used in this way for about three years, has given good service. Although it is easy to apply by hand, a wrapping machine has been used in some cases for fairly extensive applications.

Another interesting way in which polyethylene tape is used at the refinery is to protect the exposed portion of anchor bolts in concrete. Taping the threads keeps them from corroding prior to the installation of equipment on the foundations. Tape is also used for temporarily stopping leaks on lines under vacuum.

(Polyethylene tape is product of Polyken Dept. of The Kendall Co., Dept. CP, 222 W. Adams St., Chicago 6, Ill. . . . or for more information check CP 1029 on handy form opposite last page.)

THAT'S INTERESTING

Sponges wipe away railroad worries

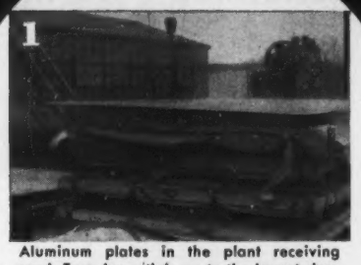
Chemistry, in the form of cellulose sponges, is rescuing the railroads from that old villain, the costly "hot box". Cel-O-Pak sponges are being used in journal boxes, the housings that contain wheel lubricant. Acting as a wick, the sponge applies lubricant efficiently, reducing friction between bearing and journal (axle) supporting car weight . . . and it does the job better, at high temperatures or in freezing cold . . . something traditional cotton packing hasn't handled. (General Mills *Horizons*, Spring 1955)

For more information on product at right, specify CP 1030 . . . see information request blank opposite last page.

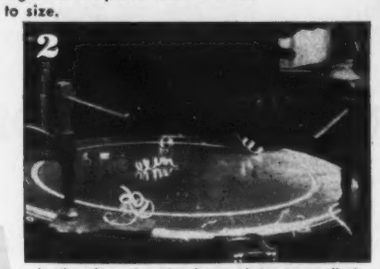
Steps to a CB&I built Aluminum Tank

• These photographs show some of the operations necessary to fabricate and erect six aluminum tanks, 17 ft. in diam. by 17 ft. 9 in. high. They were built by Chicago Bridge and Iron Company for the Carbide and Carbon Chemical Corporation at Institute, West Virginia.

CB&I is a leader in the field of specialized welded plate structures with more than 65 years of experience. Their four plants have complete facilities for designing, fabricating and erecting steel and other metal plate structures to the most exacting requirements. When you plan . . . plan with CB&I. Write our nearest office for further information.



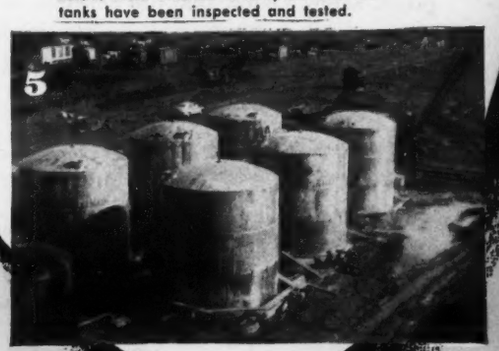
Aluminum plates in the plant receiving yard. From here, they go to the layout shop for marking from templates and are then trimmed to size.



In the shop the aluminum plates are rolled to the required shape and fittings and connections are machined to the proper dimensions.

This view inside the tank shows the lower ring of the shell being welded to the aluminum bottom.

Above: The top ring, roof and fittings, after being welded together are lifted into place as a unit.
Below: Field erection is complete and the tanks have been inspected and tested.



Chicago Bridge & Iron Company

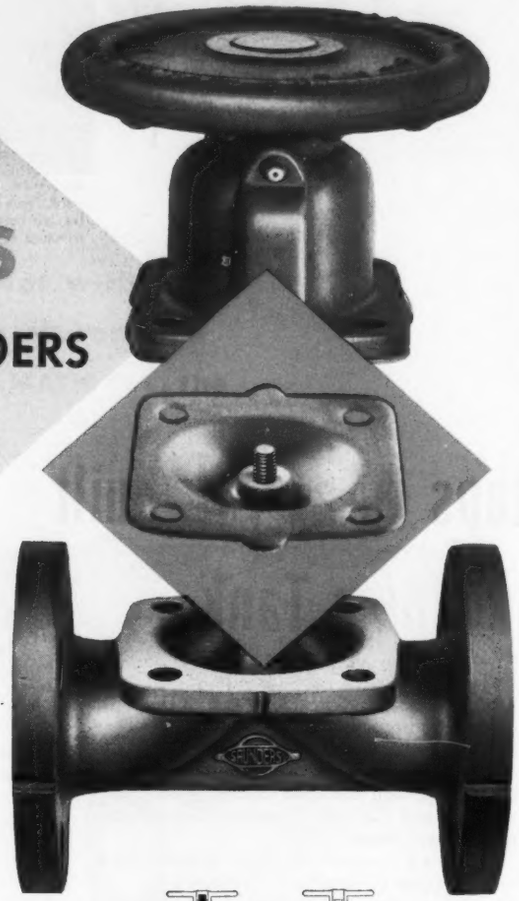
Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston
Los Angeles • New York • Philadelphia • Pittsburgh • Salt Lake City
San Francisco • Seattle • Tulsa
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

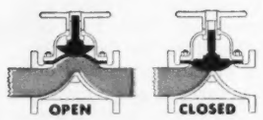
CB&I

Unaffected by all chemicals normally found in industry

Teflon Diaphragms

for GRINNELL-SAUNDERS DIAPHRAGM VALVES





Having valve trouble? Are your chemical services so tough that valves disintegrate? Grinnell-Saunders Diaphragm Valves with TEFLON* diaphragms may solve your problems.

Grinnell TEFLON diaphragms are made by a new and unique process which produces a better product of greater density, toughness and flex life. TEFLON offers a high degree of chemical inertness to all chemicals normally found in industry.

Grinnell-Saunders Diaphragm Valves are available with bodies of iron, bronze, stainless steel, cast steel, aluminum, Monel, Saran, Durimet; and with body linings of glass, lead, soft or hard rubber, neoprene, Saran. Diaphragm life depends on temperature, pressure, and frequency of operation. Your inquiries, which should be accompanied by complete service data, will receive prompt attention.

- **Diaphragm lifts full height for streamlined flow in either direction**
- **Resilient diaphragm assures positive, leak-tight closure even with grit or scale in the line**
- **Diaphragm absolutely isolates working parts from fluid . . . sticking, clogging, contamination, corrosion eliminated**
- **Body, lining, and diaphragm materials to suit service**
- **Simple maintenance. Diaphragm can be replaced easily without removing valve from line. No packing glands to demand attention. No metal-to-metal seats to become damaged or wire-drawn**

Registered Trade-Mark, E. I. du Pont de Nemours & Company, for its tetrafluoroethylene resin.

GRINNELL

WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
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industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

When inquiring check CP 1031 opposite last page

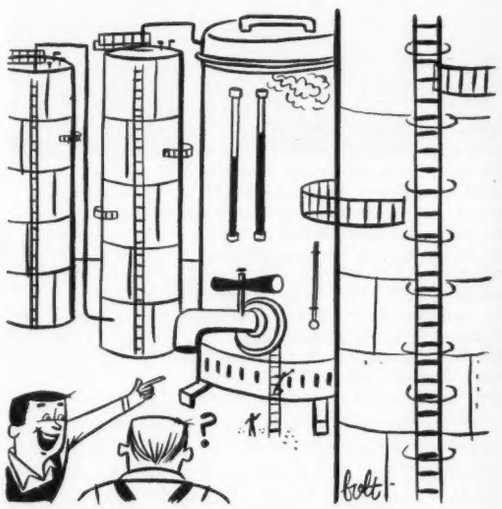
(*Continued from page* 28)

CP Staff Photo

One of Banbury mixers in operation at Ohio Rubber Company

jects by catching material improperly compounded before curing when it is still salvagable. In this way uniformity and product quality have been improved. Wattmeters have been relatively free from maintenance.

(Graphic wattmeters are manufactured by The Esterline-Angus Co., Inc., Dept. CP, P. O. Box 596, Indianapolis 6, Ind. . . . or for more information check CP 1032 on handy form which is located opposite last page.)



"That's one of our most important stand-by units!!"

ADVERTISEMENT—*This entire page is a paid advertisement* *Prepared by U. S. Industrial Chemicals Co.*

U.S.I. CHEMICAL NEWS

Sept.-Oct. ★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1955

TWO NEW CHEMICAL PLANTS LOCATE AT ASHTABULA, OHIO

U.S.I. Offers 3 Series of Polyethylene Resins

U.S.I. polyethylene grade numbers have been realigned into three well-defined groups. Resins in the 100, 200 and 300 series are available from the plant at Tuscola, Ill. and from warehouse points at Anaheim, Cal.; Chicago, Ill.; Cincinnati, O.; Jersey City, N. J. and New Orleans, La. They are:

PETROTHENE* 100—*Tubular film extrusion* resin having good transparency; medium flow, for *blow molding.*

PETROTHENE 110 — *Tubular and sheet film extrusion* resin having good transparency; superior slip properties; medium flow.

PETROTHENE 200 — All purpose resin for general *molding and extrusion, film,* or *small parts.*

PETROTHENE 201 — Medium to High flow resin for *molding, extrusion, paper coating, blow molding.*

PETROTHENE 202 — *High flow resin* for *injection molding, large parts, coating applications.*

PETROTHENE 203 — Medium to High flow resin for *injection molding* and *paper coating.* Stiffer than "202" in molded part.

PETROTHENE 210 — *Sheet film extrusion resin* (Type 200) having good transparency; exhibiting superior slip properties.

The Petrothene 300 series is especially adapted to wire covering and electrical insulation applications.

Samples and property data on request.

*Trade Mark

Chemical PA's Discuss Purchase vs. Manufacture

Seven considerations in buying versus making custom chemicals were discussed at the June meeting of the Chemicals and Allied Products Buyers Group of the National Association of Purchasing Agents. D. B. Black, sales manager for fine chemicals at Dow, and the principal speaker, enlarged on the considerations of production set-up, equipment, time factors, man power, risks and capital.

Officers of the group, elected at the meeting, include: G. C. Fordyce (American Cyanamid) — General Chairman; S. E. Spencer, Jr. (William S. Merrell) — General Vice Chairman; R. G. Weigel (Eli Lilly) — Chairman, Pharmaceuticals and Fine Chemicals Section; J. W. McKinney (DuPont) — Chairman, Heavy and Industrial Chemicals Section; A. T. Ericson (Lederle) — Secretary; J. M. McNeil (Goodrich) — Treasurer.

January 24, in Chicago and January 31 in New York have been fixed as the dates for the next midyear meeting of the group.

Titanium and Fatty Alcohol Units Join Interrelated Chemical Complex; Local U.S.I. Sodium Source a Factor

The Great Lakes port of Ashtabula in Northeast Ohio is fast becoming one of the important chemical centers of the country. Over the past ten years the towers of half a dozen large process plants have come to dominate the skyline. The presence of U.S.I.'s metallic sodium plant at Ashtabula has catalyzed the growth of this new production area.

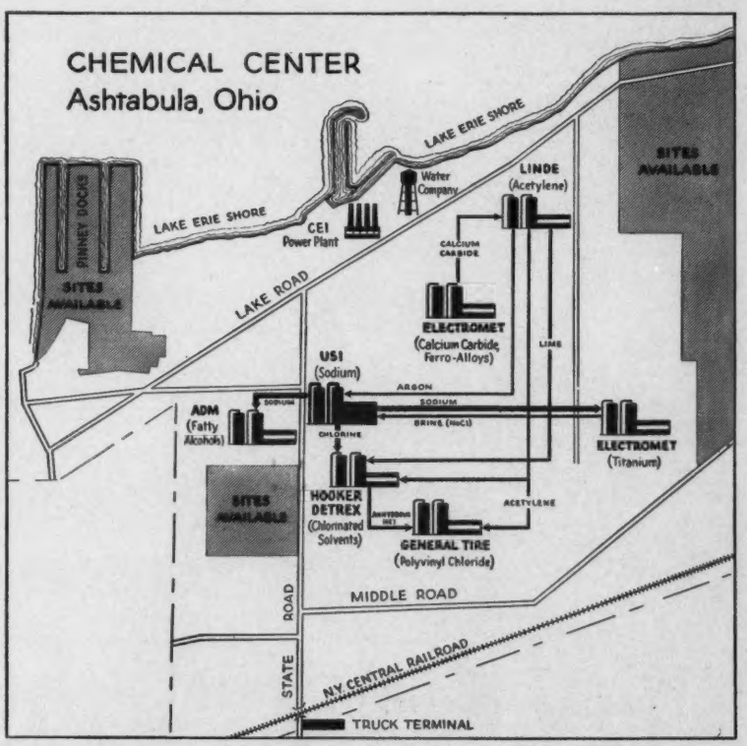
The chemical units relate, one to the other, in many ways. Products and by-products of one installation feed the process streams of the others. One plant's by-product material is another's source of supply.

Latest additions to the Ashtabula complex are Archer-Daniels-Midland's new fatty alcohol plant, and a new 7500-ton per year titanium plant now being built by Union Carbide's Electromet Division. They tie in with existing units in this manner:

Archer-Daniels-Midland's plant, which went onstream in June, uses U.S.I. sodium for reduction of fats and oils to saturated and unsaturated C_8 to C_{22} fatty alcohols, many of which have never been available before in commercial quantities. By-product caustic will be sold to chemical plants and other industry in the Northeast Ohio area. The availability of plentiful sodium from U.S.I. figured heavily in ADM's initial plans for entering the fatty alcohol business, and locating in Ashtabula.

The U.S.I. sodium plant will supply metallic sodium to Electromet for reaction with titanium tetrachloride to produce titanium metal. Sodium chloride (brine) will be a by-product. The brine will be returned to U.S.I. for production of chlorine and more sodium. Due to rigorous specifications on titanium raw material purity, U.S.I. will use an atmosphere of pure argon in the sodium refining process, resulting in sodium of a purity not previously available commercially. The argon

MORE



Sept.-Oct. ★ **U.S.I. CHEMICAL NEWS** ★ 1955

Seawolf Launched — Sodium Vital to Her Atomic Power Plant

Courtesy of General Dynamics

On July 21 the second U.S. atomic submarine Seawolf slipped down the ways into the Thames River at Groton, Conn. The first atomic submarine Nautilus had preceded her by 6 months, but there is more than a time difference between the two vessels. Their nuclear power plants differ. While water was used as the coolant in the Nautilus, liquid sodium performs this function in the Seawolf. The coolant (in effect) transfers the heat generated by atomic fission within the reactor to the boiler, which turns it into steam for the turbine. On the advantages of the sodium system, we quote from the *New York Times* of Friday, July 22:

"General Electric — which built the Seawolf reactor — claimed these advantages for sodium:

"Because sodium does not boil, except at extremely high temperatures, the reactor coolant system does not have to be pressurized.

"Sodium is an excellent conductor of heat.

"Sodium, when its oxygen content is low, is noncorrosive to steels at operating temperatures.

"Sodium is a good electrical conductor: because of this it can be circulated by a magnetic pump that has no moving parts.

"Intermediate spectrum neutrons place fewer restrictions on the structural materials that can be used in the reactor core. For example, stainless steel can be used. This is because high energy neutrons are not readily absorbed by conventional metals."

Use of sodium as a heat transfer medium in atomic reactors takes advantage of sodium's *physical properties*. Most applications among U.S.I.'s sodium customers utilize the *chemical activity* of sodium.

Methionine Protects Against Irradiation

Recent reports from several researchers working independently in the United States and abroad have demonstrated the ability of methionine to protect against irradiation injuries. In the experiments, X-rays were used as the irradiation source and various laboratory animals were tested. The test animals were fed methionine prior to the exposure. Even under massive doses of irradiation the test animals remained relatively unharmed. On the other hand, the control animals showed skin lesions, some mortality and other typical evidences of irradiation damage.

This protective effect of methionine may be related to its previously reported ability to speed restoration of damaged tissue following burns, wounds and related skin injuries.

CONTINUED ASHTABULA

will be supplied by the Ashtabula plant of Linde Air Products Company, another Division of Union Carbide.

Location Advantages

The two new plants share with U.S.I. and other chemical enterprises in the area advantages of abundant water, land, labor and electric power. Easily available raw materials and markets plus transportation facilities by road, rail and water, have been important factors in the expansion of Ashtabula's chemical family.

In addition, the St. Lawrence Seaway, when completed, will add to the breadth of markets and greatly increase the number of raw materials easily and economically accessible to the area. In anticipation of the Seaway's coming, Ashtabula is increasing dock area by 40%, and expects to increase the harbor depth to 25 feet.

In every direction U.S.I. and its Ashtabula neighbors are preparing for a busy time to come on "Lake Erie's Chemical Shore."

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

A new silicone rubber remains flexible at 600°F for 150 hours or longer. Other characteristic properties are unaffected. Suggested for kitchen oven door seals and parts for hot materials handling equipment in industry. **(No. 1110)**

A new melamine-type resin for the paper trade bolsters tensile and wet burst strength. It also improves dry Mullen, wax pick, freedom from lint, dry stiffness, wet rub resistance, internal sizing and folding endurance. **(No. 1111)**

Simple new formula for estimating methionine requirements in broiler rations, plus wall chart giving methionine content and energy levels of common feedstuffs, are now available to feed manufacturers. **(No. 1112)**

An improved method for water-free hydrazine by azeotropic distillation has been described. The process yields anhydrous material directly, avoiding the costly two-step process necessary in previous conventional methods. **(No. 1113)**

A new, nonfoaming wetting and rewetting agent has been developed for exceptionally high speed dyeing and finishing of cottons, rayons and synthetics — where foam interferes. Very low concentrations are recommended. **(No. 1114)**

A versatile new small-scale Dissolver with stainless steel shaft and impeller is especially designed to speed work in labs, pilot plants and small batch production. Gives 2 to 20 times the speed of conventional machines. **(No. 1115)**

A chemically-resistant filter felt made of tightly compacted Dynel fibers bonded with Vinyon has been developed for pressure filters and centrifuges. It is easy to clean, does not shrink. Maximum temperature is 170°F. **(No. 1116)**

A new polyglycol ether removes neoprene protective coatings from aircraft Radomes in less than two hours. Applied as a paste and allowed to stand, the ether reduces to one half a man hour what was once an 8-hour job. **(No. 1117)**

Oxidation of hot solder can now be prevented in continuous operations where the solder is kept molten in the pot. A synthetic wax, put over the top, melts to form a continuous protective coating. The wax also aids fluxing. **(No. 1118)**

A new plastisol gives outstanding adhesion to black iron, steel, galvanized and other metal surfaces, without primers. Used for caulking sewer and drainage pipes, and for drum linings where acid and alkali resistance is essential. **(No. 1119)**

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Alcohols • Solvents • Polyethylene Resins • Inorganic Chemicals • Esters • Ethers and Ketones • Intermediates and Fine Chemicals • Animal Feed Products • Pharmaceutical Products

U.S.I. INDUSTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation

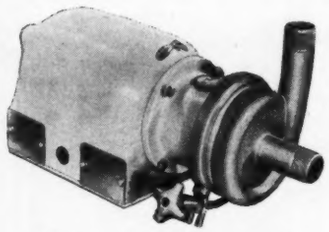
99 PARK AVENUE, NEW YORK 16, N. Y.

Stainless steel equipment solves abrasion problem in tile plant

Problem: Abrasive action of finely ground flint in liquid glaze solution was wearing out iron pumps and tube rapidly at National Tile and Manufacturing Company, Anderson, Indiana. Rough surfaces resulting from abrasion made it almost impossible to clean the equipment. Tube would clog up and pumps would lose pressure, resulting in uneven glazing and coloring.

Rejection of off-color tile was expensive. Color of glaze could not be changed without some previous color showing up on the tiles.

Solution: Iron pumps and tube were replaced by stainless steel equipment. Surfaces inside and out are smooth and rounded to



Outlet can be set at any angle

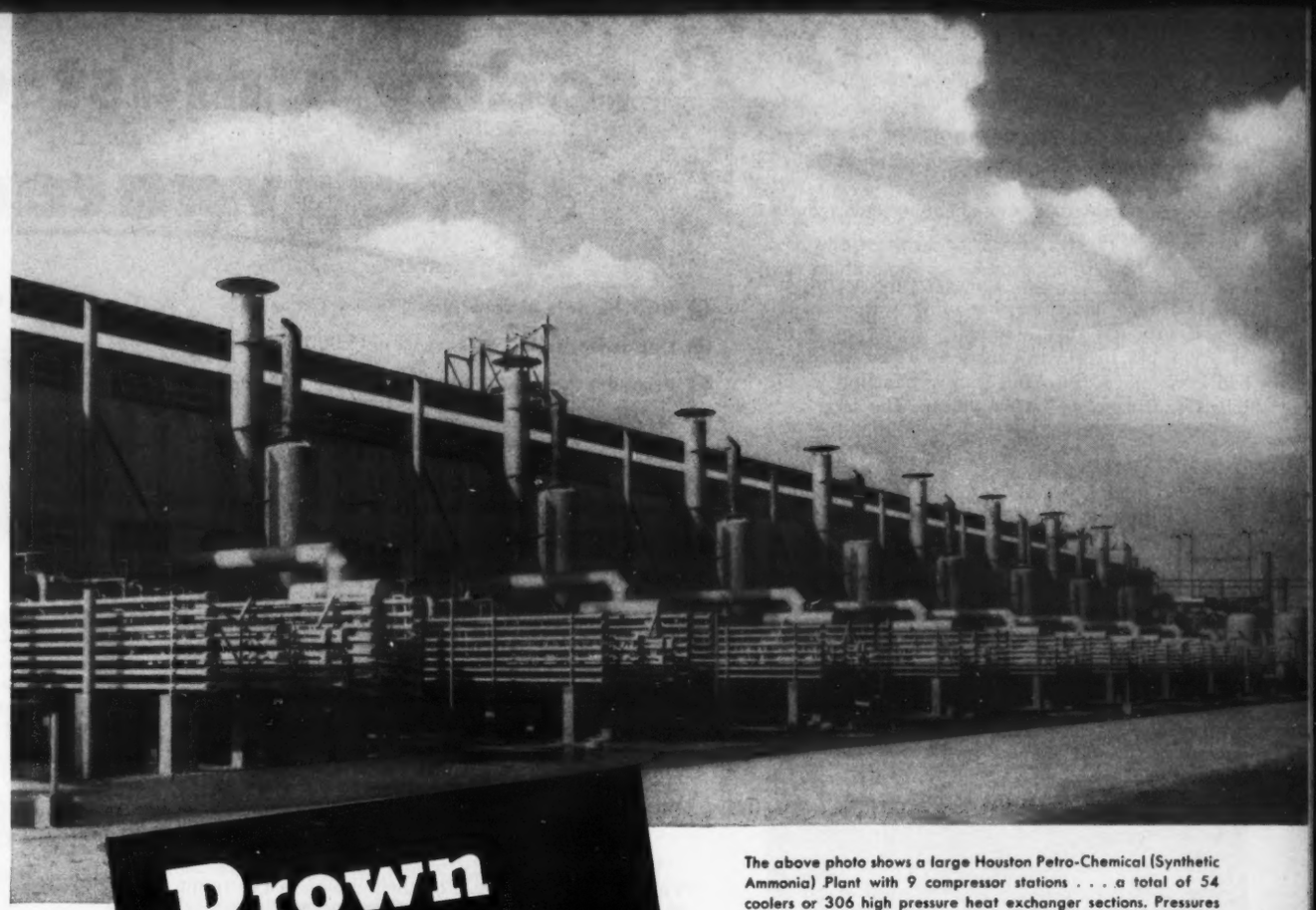
make cleaning easy. Both the tube and pumps are easily cleaned by flushing water through them. Splash-proof motors on pumps can also be washed down.

Pump's design is such that the outlet can be set at any position — up, down, left, right, or any angle.

Results: In use for over 1½ years, the tube and pumps have given satisfactory service.

(Flexflo pumps and tube are product of Cherry-Burrell Corporation, Dept. CP, 427 W. Randolph Street, Chicago 6, Ill. Check CP 1032A opposite last page.)

For more information on product at left, specify CP 1033 . . . see information request blank opposite last page.



Brown Fintube

The above photo shows a large Houston Petro-Chemical (Synthetic Ammonia) Plant with 9 compressor stations . . . a total of 54 coolers or 306 high pressure heat exchanger sections. Pressures from 72 psi to 5300 psi.

Brown high pressure heat exchanger sections are now performing, with high efficiency, in almost all the Petro-Chemical plants that have been built in the last five years.

BFT high pressure sectional heat exchangers are available for pressures up to 22,000 psi.

High Pressure

HEAT EXCHANGER SECTIONS

HEAT EXCHANGE SURFACE
BROWN FINTUBE
HEAT TRANSFER PRODUCTS

BROWN FINTUBE COMPANY

Elyria, Ohio

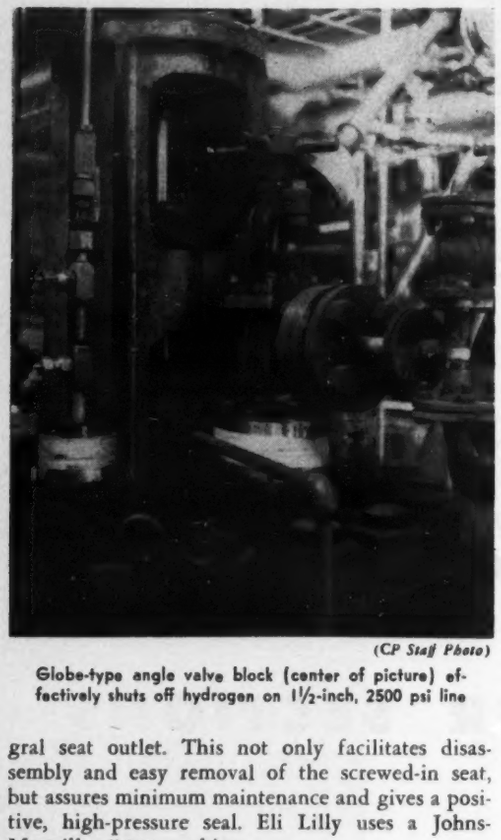
When inquiring check CP 1034 opposite last page

No valve leak despite 2500 psi in hydrogenation service . . .

design provides a positive high-pressure, reduces maintenance to minimum

Problem: A 1½-inch line carrying high-pressure hydrogen had to be shut off between runs on several products that required working pressures of 2500 psi for hydrogenation. These products had been moved into full-scale production at Eli Lilly's Indianapolis, Indiana, plant. The large size of this line presented a problem in throttling that was not present in the previous pilot plant setup.

Solution: A specially-designed flanged angle valve was placed in the line. Valve is made of 316 stainless steel, and is manually operated. An unusual engineering feature is the pressure seal integral seat outlet. This not only facilitates disassembly and easy removal of the screwed-in seat, but assures minimum maintenance and gives a positive, high-pressure seal. Eli Lilly uses a Johns-Manville #211 packing.



(CP Staff Photo)

Globe-type angle valve block (center of picture) effectively shuts off hydrogen on 1½-inch, 2500 psi line

Results: Performance is effective and amply safe. Valve receives routine maintenance at ninety day intervals, and has proved least troublesome of any part of the system.

(High-pressure valve is a product of The Wm. Powell Co., Dept. CP, 2503-31 Spring Grove Ave., Cincinnati 22, Ohio . . . . or for more information check CP 1035 on handy form opposite last page.)

today's most complete *advanced design*

- **863 Models** in three Basic Pressure Groups.
- **Capacities** from 2 cc. per hour to 15,000 gal. per hour.
- **Pressures** to 50,000 psi.
- **Mediums Handled.** Any liquid that will flow to the Pump—clear free-flowing, viscous, tarry materials and slurries—corrosive mediums such as acids, alkalies, salts, oxidizing and reducing agents, etc.
- **Capacity Control**—manual or automatic for proportioning in relation to temperature, time, flow, pH value, liquid level, pressure, color, conductivity or any other meterable factor.
- **Metering Accuracy** to two-tenths of one percent with automatic control mechanisms.

Now, no matter what your chemical proportioning problem—you will find the answer at PHILADELPHIA PUMP, "headquarters" for the most complete line of Controlled Capacity Pumps.

Advanced Design Offers Savings In First Cost and Maintenance

Pump users actually wrote the specifications for PHILADELPHIA PUMPS. For their design is the result of an industry-wide survey of pump users' practical experience on "what is wrong with the proportioning pumps you are using."

Simplification and standardization of basic features, and more efficient production methods, have answered the first complaint—High First Cost. Model for model, PHILADELPHIA PUMPS are lower in price.

Prevalent points of failure—cross-heads, connecting rod bearings, pressed valve seats, packing, etc.—have been corrected through advanced design and better materials of construction.

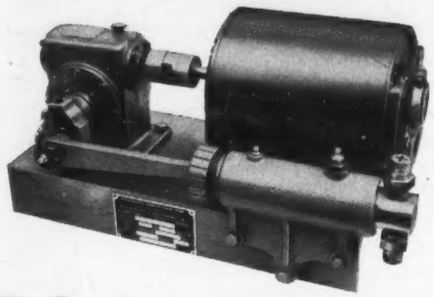
High Maintenance Costs—excessive down time and labor—have been eliminated by a design which permits the removal of all moving parts and packing through the oversize cross-head without breaking piping connections.

Proved by Years of Service In Leading Plants

Repeat orders testify to user satisfaction, and it is significant that engineers who know pumps best, men who purchase quantities of them annually for some of the largest plants—prefer PHILADELPHIA PUMPS.

It will pay you to investigate. Write for catalog.

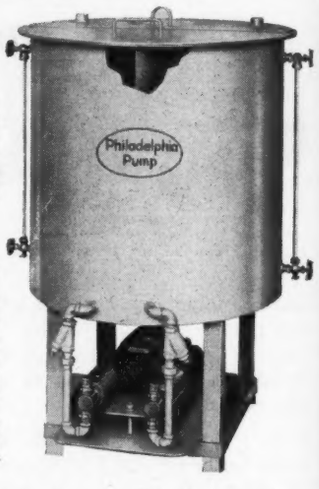
Pressures to **800** psi



LP Series The Phila-Feeder controlled capacity Proportioning Pump—a low cost, high quality pump popular for feeding water treating chemicals into steam boilers. Made in simplex and duplex types for maximum capacity to 18 gph. Adaptable to manual or automatic control.

Packaged Chemical Feed Units

PHILADELPHIA PUMP offers many standard and special designs of self-contained Units to meet all chemical feed requirements.



Unit illustrated is for feeding water treating chemicals. It comprises welded steel storage tank, Phila-Feeder duplex pump and all necessary auxiliaries and piping ready to connect to chemical feed piping and electrical circuits.

Other special Chemical Feed Units developed by PHILADELPHIA PUMP include:

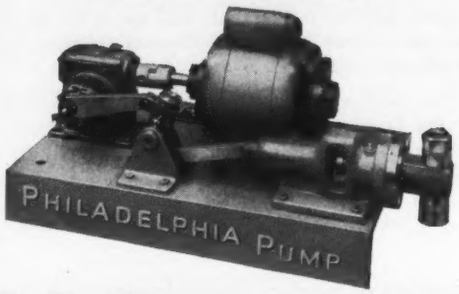
- Oil Well Chemical Treating Systems
- Natural Gas Odorizing Units
- Special Chemical Mixing & Proportioning Units

• *Sales Engineers in principal industrial centers in the United States, Canada, Mexico, and abroad.*

PHILADELPHIA

line of proportioning pumps

Pressures to **1500** psi

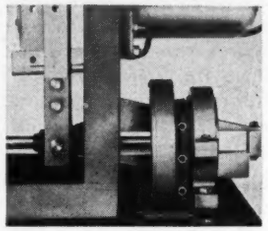


S Series

Made in simplex and duplex types for maximum capacity to 3300 gph. The standard proportioning pumps for most Processing Industry requirements and for treating of boiler water, municipal and industrial water, and sewage.

The pump illustrated is equipped with rocker-arm micro-adjustment of pump capacity while running.

The PHILATROL Automatic Control



This patented control mechanism for exceedingly accurate proportioning in relation to any meterable factor, adjusts piston stroke and hence pump capacity in response to manual, hydraulic, pneumatic or electrical motivation. It permits continuous stepless adjustment from zero to maximum and eliminates the "hunting" characteristics of other mechanisms with coarser adjustments.

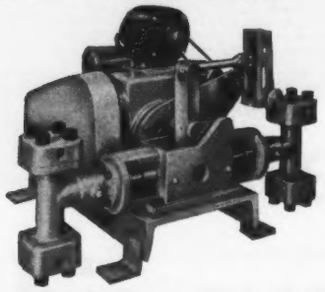
Illustrated is Philatrol Mechanism installed with air actuator on PHILADELPHIA PUMP used in gas odorizing. This pump has maintained metering accuracy within plus or minus two-tenths of one percent.

The UNI-FEEDER Automatic Control

Uni-Feeder single-revolution-clutch operated PHILADELPHIA PUMPS inject one or as many as 72 or more measured slugs of fluid per minute according to a time cycle or flow, color, concentration, or any other meterable factor.

Uni-Feeder Pumps are available with minimum capacities from .000093 gallons to maximum capacities of 27 gallons per minute.

Pressures to **50,000** psi



HP Series

These PHILADELPHIA PUMPS, designed for higher viscosities and pressures, are available in simplex, duplex and quadruplex types and in capacities from 2 cc. to 15,000 gph.

Like all PHILADELPHIA PUMPS, they are adaptable to both manual and automatic control of capacity.

The design of these pumps offers mechanical advantages which permit reduction in horsepower normally required by as much as 30 percent.

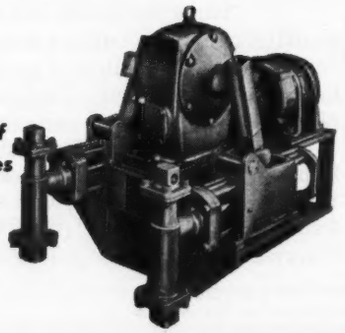
Differential Pressure Pumps

PHILADELPHIA PUMPS of the HP Series also offer a design feature which permits them to utilize the energy incorporated in any suction pressure to decrease the amount of horsepower required to produce the desired discharge pressure.

For example, if suction pressure is 2000 psi and discharge pressure is 3000 psi, the pump requires powering only for the differential pressure of 1000 psi, plus a small addition for friction losses. Consequently, great savings in first cost (motor, gear reducer, etc.) and operating cost can be effected.

See Our Exhibit at the 25th Exposition of Chemical Industries

December 5-9 1955



PUMP AND MACHINERY COMPANY
PHILADELPHIA • PENNSYLVANIA
SUBSIDIARY OF AMERICAN METER COMPANY / EST. 1836

When inquiring check CP 1036 opposite last page

Acid-tank painting costs cut by 85% with neoprene

A reduction of over 85% in paint maintenance has been one result of an application of neoprene coatings made more than two years ago on the center sheet and dome areas of acid-tank trucks operated by Chemical Tank Lines, Inc. (a Leaman affiliate), Downingtown, Pa. Only slight touch-ups have been needed since the coatings were originally applied.

First of three neoprene coats being brushed onto "splash" area of acid-carrying tank. Remainder of tank is protected by two coats of gray neoprene maintenance paint

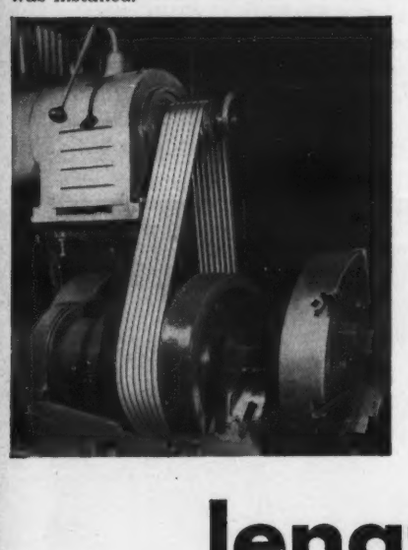
This 64-tanker fleet transports all commercial acids in all weather conditions, and the "splash" area of the tanks, in particular, is subjected to rugged corrosive conditions. Previously, acid-resistant paints had been standing up only a couple of months and trucks had to be repainted about six times a year. Figuring a $100-per-truck loss in revenue for each layup for painting, the line counted about $38,000 lost annually to paint maintenance.

Two kinds of neoprene coatings are now used on the trucks: a black, two-part system for the "splash" area, and a gray, one-part coating for the remainder. Three coats of the black material are used, while two coats of the gray suffice. A primer is applied to the entire trailer prior to neoprene application.

Since the truck fleet has received this neoprene protection, revenue losses for layup time per truck have amountd to only $50 per year, as opposed to $600 formerly. Service life of tanks has been increased 80% . . . a saving of $7200 per truck in replacement costs.

(Corrocote neoprene coating Nos. 77 and 362 and primer No. 107 used on acid tanks are products of Chemical Coatings & Engineering Co., Dept. CP, 2635 Westchester Pike Broomall, Pa. . . . or for more information check CP 1037 opp. last page.)

This large lathe was formerly driven by a flat belt which slipped on heavy cuts, stalled and broke tool bits. Savings on broken tool bits alone offset the cost of the drive the first year—and production was increased 25% after the V-belt drive was installed.



concave sides lengthen V-belt life ...cut costs

Fig. 1

Hundreds of plants that keep track of V-belt drive costs know this: Gates Vulco Ropes . . . the V-belts with *concave sides*...wear much longer and *cost less per year of service.*

Here is the interesting reason why:

Fig. 1-A

When a Gates V-belt bends around the sheave, the *precisely-engineered* concave sides (Fig. 1) fill out and become straight. Thus the sides of the belt make full, uniform contact with the pulley (Fig 1-A).

Naturally, uniform contact distributes the wear *evenly*. And *even* wear means *longer* wear.

Longer wear saves not only on replacement costs; it also saves the cost of down-time... keeps equipment producing.

Fig. 2

Fig. 2-A

Simple test proves value of concave sides

Take a straight-sided V-belt (Fig. 2) and bend it. Feel the sidewalls of the belt bulge out as the belt bends. You see immediately that the bulging sides prevent uniform contact with the pulley (Fig. 2-A). Uneven contact causes faster wear...increases your drive replacement costs.

Let the cost-saving longer life of Gates Vulco Ropes contribute to *your* profits. Specify Gates Vulco Ropes—the V-belts with concave sides (U.S. Patent 1813698). The Gates Rubber Co., Denver, Colorado—*World's Largest Maker of V-belts.*

Gates Engineering Offices and Distributor Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

TPA-54A

GATES VULCO ROPE DRIVES

When inquiring check CP 1038 opposite last page

NEW SOLUTIONS of processing problems

Filter has 50 million pores per square centimeter

Case histories of the use of a 50 million pore per sq cm filter in atomic energy work are described in four-page brochure. Filter achieves separation of microscopic and submicroscopic particles. Bulletin includes specifications and flow-pressure charts. Separate section deals with use of the filter as research tool for study of effects of radiation on biological organisms.

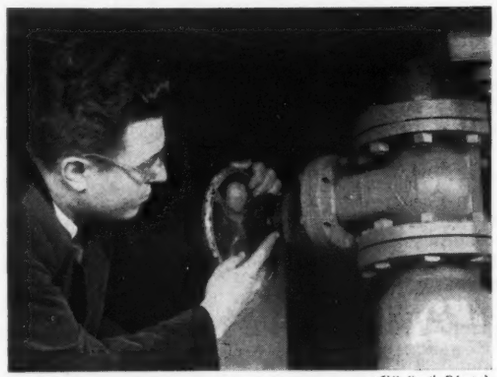
"The Millipore Filters" is issued by Millipore Filter Corporation, Dept. CP, 36 Pleasant Street, Watertown 72, Mass. When inquiring specify CP 1039 on handy form opposite last page.

Possibility of product contamination eliminated by valve design . . .

Eli Lilly uses non-rising, solid-wedge stainless gate valves in fermentation of antibiotics

Problem: All precautions to guard against product contamination had to be taken when Eli Lilly's antibiotic fermentation tanks were designed and installed about four years ago. Valves were looked upon as a possible source of contamination. Therefore valves which were easy to clean, would withstand steam sterilization, and which would not bring unclean surfaces into contact with the fermentation product were sought.

Solution: Engineers at the Indianapolis pharmaceutical house specified solid-wedge stainless steel, non-rising gate valves to be used.



(CP Staff Photo)

Four-inch stainless harvest valve on bottom of fermenter is non-rising, has solid wedge and multiple-bolted bonnet

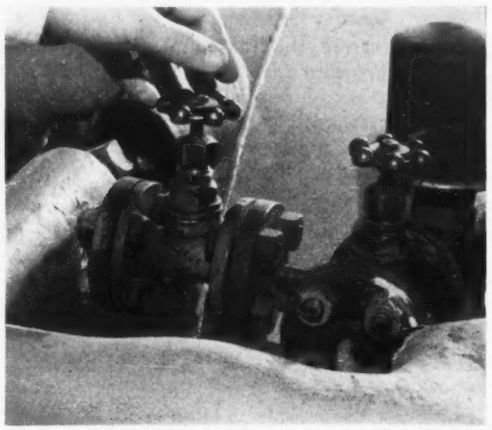
The solid wedge provides maximum resistant to pressure strains, and is raised completely out of the flow line when valve is opened. It is double-tapered, with no projections on the flat seating faces. Therefore refacing is made easy. The wedge is

raised or lowered by the spindle thread as the valve is opened or closed.

Valve seat is integral with the body, so that no corrosion cell forms in the seat ring threads. Made of Type 316 stainless steel, the carbon content of the metal is held below 0.07%, thus assuring against carbide precipitation at grain boundaries as well as increasing corrosion resistance.

The harvest valve beneath the fermenter (see picture above) is a four-inch Fig. 1305 type. This is a multiple-bolted bonnet type. The valves used on the antifoam oil lines (pictured below) are ½" Fig. 1301 screw-in bonnet type. The valves are packed with Teflon-impregnated asbestos, JM 2012.

Results: In addition to preventing exterior contaminating effects from entering the process



(CP Staff Photo)

Valves on ½-inch antifoam oil line have screw in bonnet

and having no interior surfaces which might clog and be hard to clean, the valves do not require additional headroom for opening.

(Non-rising stainless gate valves are products of Jenkins Bros., Dept. CP, 100 Park Ave., New York 17, N. Y. . . . or for more information check CP 1040 on handy form opposite last page.)

Production of soap solution stalled until positive-displacement pumps were used in filling . . .

eliminate problem of froth and foam which had been interrupting operations

Problem: Chemical preparation and bottling of novelty soap solution for bubble-blowing toy devices hit a snag at Aladdin Sales Co., Jersey City, N.J., when air entrainment due to froth-producing action of centrifugal pumps stalled operations. By

(Continued on next page)

S/K apades in industry

THE CASE OF THE PUNGENT POTS AND THE PROCESS MAN WITH A PLAN

"Gadzooks!" cried Pete the Process Engineer, as he clamped a clothespin on his nose. "I dever sbelled anythig as obdoxious as doze varnish keddles."

The kettles kept right on fuming—and so did the employees who had to endure the odor.

"Do somethig," gasped the Plant Manager. "Those nauseatig fubes and odors are perbeating the whole fagtory. Peoble turn up their dozes at working here . . . "

Pete went into his office and held his head. A jet unit would alleviate odors and pacify his disgruntled boss. A jet unit, but what kind? And what about hoods, ductwork, recirculating system? A *jet* unit? Yes! No fan to corrode or wear out . . .

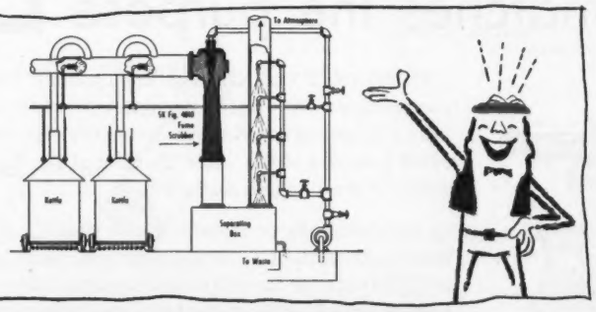
Pete wrote Schutte and Koerting for a copy of new Bulletin J-1 on "Jet Apparatus and Its Industrial Applications." That told him all he needed to know about the varieties, ranges and characteristics of Jet Apparatus.

Bulletin J-1 pinpointed the data he needed. He located the desired function, the types of jets suitable for such a function, the type most suitable for his particular requirements.

Then he phoned for a specialist—his nearby SK Sales Engineer, who came a-running. And from him, Pete got a specific recommendation.

LICKED THE PROBLEM IN A JIFFY!

The SK Fig. 4010 Jet Fume Scrubber now removes fumes from a battery of four varnish kettles, washes these fumes and discharges clean air to atmosphere. Corrosion is no problem, since the scrubber has a fume-resistant lining. As a matter of fact, the fume scrubber has been operating successfully for over five years!

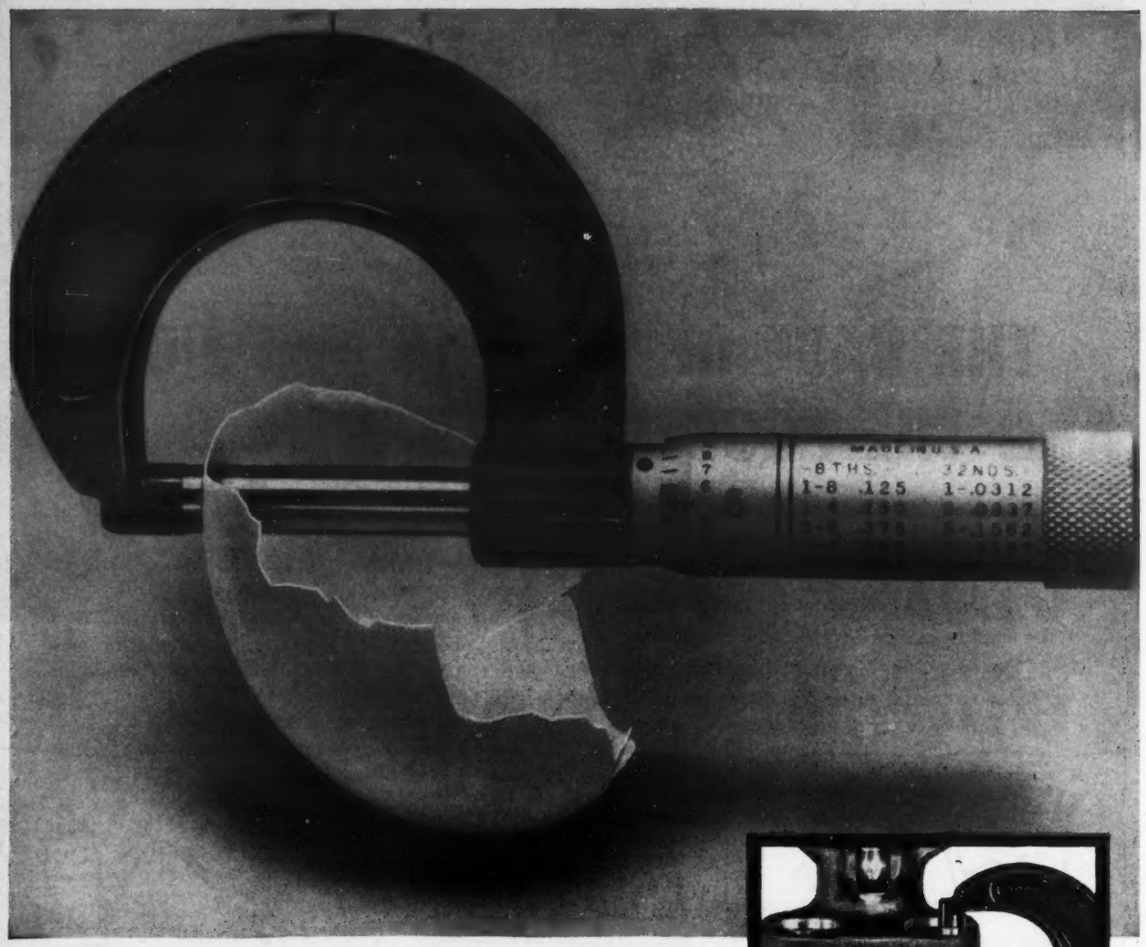


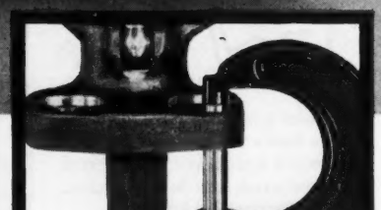
MORAL: *Send for a copy of Bulletin J-1 for your files. And make use of a qualified specialist on jet apparatus —your nearest SK Sales Engineer.*

Schutte and Koerting COMPANY
MANUFACTURING ENGINEERS
2218 STATE ROAD, CORNWELLS HEIGHTS, BUCKS COUNTY, PA.

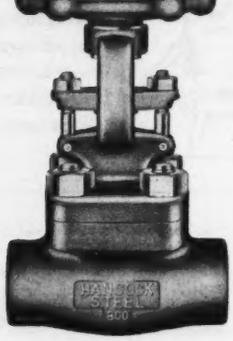
Jet Apparatus • Heat Transfer Equipment
Strainers • Condensers and Vacuum Pumps
Oil Burning Equipment • Rotameters
Flow Indicators • Radiafin Tubes • Valves
Spray Nozzles and Atomizers • Gear Pumps
Desuperheaters

When inquiring check CP 1041 opposite last page





STRENGTH
that matches the purpose



THE BONNET FLANGES on the Type 950 Hancock Steel Gate Valve combine compactness with rugged strength *where strength is needed most.* Flange thickness and bolting provide sturdiness that can withstand more than ten times the rated pressure of the valve. Butting of the flange faces eliminates every possibility of bending and distortion.

In revalving old, or installing new process and power piping systems, the enduring strength of Type 950 Hancock Steel Gate Valves always proves there is no substitute for the economy of quality. Get complete facts. Phone your Industrial Supply Distributor today.

HANCOCK VALVES

A product of

MANNING, MAXWELL & MOORE, INC.

Watertown 72, Massachusetts

In Canada: *Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario*

When inquiring check CP 1042 opposite last page

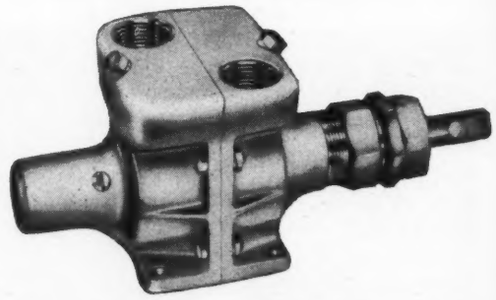
(Continued from preceding page)

Four positive-displacement pumps (with hoses attached) take soap solution from 55-gal drums, deliver it to filling unit with no foaming

its very nature the concentrated soap solution would erupt into foam with the slightest introduction of air during filling process. Procedure involves drawing soap solution from 55-gal drums for a four-tank filling machine, which meters liquid into four- and eight-ounce jars.

Solution: About two years ago, Aladdin substituted four positive-displacement pumps, which have two opposed axially-oscillating impellers, for the existing pumps. The displacement pumps, chosen for their continuous flow pattern characteristics and their Teflon-stainless construction, operate against heads of 15 to 40 psi.

Flow rates for each pump, depending on speed adjustment, are variable up to 10 gpm.

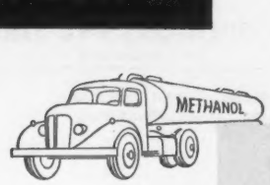


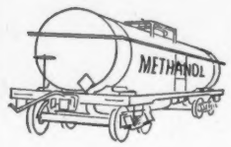
Teflon and stainless steel construction of pump enables handling of liquids in wide pH range

Results: Aladdin has no more "bubble trouble" when filling soap solution. No frothing or foaming takes place in pump, which acts as a constant-flow metering device . . . drawing in and expelling soap solution free from undesirable air entrainment.

(All-Chem positive-displacement pumps are products of Eco Engineering Co., Dept. CP, 12 New York Ave., Newark 1, N.J. . . . or for more information check CP 1043 on handy form which is located opposite last page.)

CHECK THESE RIGID SPECIFICATIONS OF





DU PONT METHANOL

Du Pont Methanol is guaranteed pure (99.85%) synthetic methanol featuring these important specifications (partial listing):

- Distillation Range*.....1.0°C. Maximum
- Non-volatile Content.....0.001% Maximum
- Acetone Content.....0.003% Maximum
- Acidity or Alkalinity.....0.003% Maximum
- Color, A.P.H.A.....5 Maximum
- Odor.....free from foreign odor
- Permanganate Test.....30 Mins. Minimum

*ASTM Method D-268

(All Percentages on Weight Basis)

PRINCIPAL USES

Methanol and products derived from methanol find application in a variety of industries (partial listing):

- **AVIATION**—carburetor injection fluid for increasing power and fuel-octane rating
- **AUTOMOTIVE**—anti-freeze for radiators and air brakes; ingredient of gasoline and diesel-oil anti-freeze
- **CHEMICAL**—raw material for methyl esters of organic and inorganic acids and formaldehyde
- **FOOD**—extractant for animal and vegetable oils
- **FINISHES**—solvent for finishes and wood-dye stains
- **METALS**—raw material for manufacture of methyl borate for soldering flux; cleaning of metal parts during fabrication
- **PEST CONTROL**—intermediate for certain fumigants and insect repellents
- **PHARMACEUTICAL**—solvent in manufacture of cholesterol, streptomycin, vitamins, hormones and other pharmaceuticals
- **PLASTICS**—intermediate for certain plastics, plasticizers; solvent and solvent adjuvant for certain polymers; softening agent for pyroxylin plastics
- **REFRIGERATION**—raw material for methyl chloride and sodium methylate; ingredient in anti-freeze brines for non-food uses and in anti-freeze for refrigerant lines

If you wish to investigate any of these uses of Du Pont Methanol that seem promising for your needs, we will be glad to send specific data. Simply mail the coupon below, or write on your letterhead today.

SPECIFY

FOR QUICK DELIVERY, UNIFORMITY AND PURITY

If you're looking for service, quality and dependability, you can rely upon these features of Du Pont Methanol:

Strategically located stock points and vast production facilities assure you of prompt delivery.

Uniform top quality from shipment to shipment assures you that variations in your products and processes using methanol will be held to a minimum.

Consistently high purity (99.85%) means that you get more for your money.

Packaging and shipping to satisfy any requirement: 6,000, 8,000 and 10,000-gallon tank cars; 4,000 to 6,000-gallon tank transports and 1,000 to 2,000-gallon tank wagons from some locations; and 55-gallon non-returnable drums.

AND REMEMBER, Du Pont has pioneered and led in the production of synthetic methanol for the past 25 years. When you specify DU PONT Methanol, you specify the *standard of the industry.*

AVAILABLE NATIONALLY THROUGH THESE AGENTS

PROMPT DELIVERY FROM THESE DU PONT METHANOL DISTRIBUTORS

Since offices listed may also serve outside the state shown, contact agent nearest you.

CALIFORNIA
Los Angeles . . . Braun Corporation, 2260 E. 15th St.
San Francisco, Braun-Knecht-Heimann, 1400 16th St.

COLORADO
Denver.....The Chemical Sales Co., 1125 7th St.

FLORIDA
Jacksonville.....Apperson Chemical, Inc. 2903 Strickland Street
Miami.....Biscayne Chemical Laboratories, Inc. 200 N. E. 11th Street

GEORGIA
Atlanta...Chemical Services, Inc., Box 264, Sta. D

ILLINOIS
Chicago.....Central Solvents & Chemicals Co. 2540 W. Flournoy St.
Chicago...Phillips & Martin Co., 5524 N. Wolcott

INDIANA
Fort Wayne...Hoosier Solvents & Chemicals Corp. Nelson Road
Indianapolis...Hoosier Solvents & Chemicals Corp. 1650 Luett Avenue

KANSAS
Wichita.....Barada & Page, Inc., 2041 N. Mosley

KENTUCKY
Louisville.....Dixie Solvents & Chemicals Co. Dixie Highway & Appleton Lane

LOUISIANA
New Orleans . . . Southern Solvents & Chemicals Corp., 917 Jefferson Highway, P. O. Box 4067

MARYLAND
Baltimore...Leidy Chemicals Corp., 920 S. Eutaw St.

MASSACHUSETTS
Boston . . . Howe & French, Inc., 101 Broad Street
Holyoke..Eastern Chemicals, Inc., 76 Front Street

MICHIGAN
Detroit.....Western Solvents & Chemicals Co. 6472 Selkirk Avenue
Grand Rapids . . . Wolverine Solvents & Chemicals Co., 1500 Century Ave., S. W.

MINNESOTA
St. Paul.....Lyon Chemicals, 2305 Hampden Ave.

MISSOURI
Kansas City.....Barada & Page, Inc. Guinotte & Michigan Avenues
Kansas City...Missouri Solvents & Chemicals Co. 2522 Nicholson Avenue
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Rensselaer.....Eastern Chemicals, Inc., South St.
Rochester.....Chemical Sales Corp., 1600 Jay St.
Syracuse.....Eastern Chemicals, 103 N. Beech St.

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Durham . . . Cardinal Products, Inc. P. O. Box 1611

OHIO
Cincinnati.....Amsco Solvents & Chemicals Co. 4619 Reading Road
Cleveland.....Ohio Solvents & Chemicals Co. 3470 W. 140th Street
Toledo.....Western Solvents & Chemicals Co. W. Central Avenue

OREGON
Portland.....Van Waters & Rogers, Inc. 3950 N. W. Yeon Avenue

PENNSYLVANIA
Pittsburgh.....Vitro Mfg. Co., 60 Greenway Dr.

TEXAS
Dallas..Van Waters & Rogers, Inc., 10216 Denton
Dallas...Texas Solvents & Chemicals, 2500 Vinson
Houston...Texas Solvents & Chemicals, 8501 Market

UTAH
Salt Lake City.....Braun-Knecht-Heimann Co. 650 West Eighth South Street
Salt Lake City.....Wasatch Chemical Co. 2225 South Fifth East Street

WASHINGTON
Seattle...Van Waters & Rogers, Inc., 4000 1st Ave., S.
Spokane.....Van Waters & Rogers, Inc. North 809 Washington Street

WISCONSIN
Milwaukee...Wisconsin Solvents & Chemicals Corp. 1719 S. 83rd Street

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Better Things for Better Living
. . . through Chemistry
Polychemicals
DEPARTMENT
CHEMICALS • PLASTICS

Which of these other chemicals are you interested in?

- ☐ HYTROL® O Cyclohexanone
- ☐ Crystal Urea
- ☐ Adipic Acid
- ☐ Hydroxyacetic Acid
- ☐ HEXALIN® Cyclohexanol
- ☐ LOROL® Fatty Alcohols
- ☐ Diglycolic Acid

SEND FOR FREE BOOKLET

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Dept. 5810, Wilmington 98, Del.

Please send me full information on Du Pont Methanol, including free booklet. I am particularly interested in using Methanol for the following applications:_____

_____

_____

Name_____ Position_____

Firm_____

Address_____

City_____ State_____

When inquiring check CP 1044 opposite last page

TYPICAL FORMULATIONS FOR CLOSED- AND OPEN-CELL PVC STRUCTURES

	Closed-cell		Open-cell		
	Soft	Hard	All Monomeric Plasticizer	All Polymeric Plasticizer	Monomeric + Polymeric Plasticizer
PVC resin, such as Geon 121	100	100	100	100	100
Admex 710					20
Aroclor 1268		15			
BC 105				2	
Cabflex DDA					20
Cabflex DDP			40		
CaO			1		1
Duponol ME			1.6		1.6
Dyphos	10				
Dythal		6			
Ferro 1820		3			
Flexol CC-55					20
Goodrite CP 261	100	15			
Paraplex G-50				50	20
Paraplex G-62				50	
RC-O 16			12		
RC-TG 9			12		20
Santicizer 603			36		
Stabelan HR Paste			3		3
Tribase		6			
Neutral Calcium Petronate			3.6	3.6	3.6
BL-353	40	30	10	10	5-16
Density (lb/cu ft)	4.5	6.9	6.9	7.1	11.7-5.1
Pandux Hardness			65	50	85-15

Controlled decomposition of blowing agent forms nitrogen gas which —

makes closed- or open-cell vinyl structures

Blowing agent can be used to prepare both rigid and resilient open- or closed-cell polyvinyl chloride structures. Agent produces uniformly fine cells in a wide variety of formulations, and over a broad range of densities and hardnesses. Neither agent nor reaction products bleach or otherwise affect the usual organic pigments used in coloring PVC either during the blowing or on exposure to UV light.

Called BL-353, agent contains 70% of N, N′-dimethyl-N, N′-dinitroso terephthalamide (NTA) and 30% white mineral oil, by weight. It is an odorless, yellow-colored, non-hygroscopic crystalline powder which has an average basic particle size in the range of 2-3μ.

Closed-cell PVC Structures

Formulation details — Optimum amount of expanding agent necessary to make rigid closed-cell foam by conventional procedures is, in general, about 40 parts phr (parts per hundred parts of resin). Minimum density for this type of sponge is in the range of 4 to 5 lb/cu ft. For soft PVC foam containing up to 130 parts plasticizer, minimum density lies between 2 and 3 lb/cu ft, with optimum concentration of the agent between 50-70 parts phr.

Choice of PVC resin is not critical. A number of commercially available copolymers and homopolymers have been found to give good results.

Type and amount of plasticizer incorporated into the expansable composition largely govern flexibility and

physical properties of end product. A wide variety may be used. Compositions containing 50 or more parts plasticizer phr are plastisols. With about 40 parts of liquid plasticizers, composition is usually a sticky dough. With lesser amounts, composition is powdery or granular.

Resin extenders may be used in certain compositions. In general, they are employed in addition to, and not in place of, the usual plastcizers. Besides lowering costs, they absorb some of the heat liberated on decomposing the active ingredient of the expanding agent.

Inert fillers may also be added to reduce costs. However they may cause cells to become large and coarse or adversely affect expansion efficiency.

Many stabilizers have been found satisfactory. The lead stabilizers, epoxy types, calcium stearate, or soap-type may be used.

Pigments such as Watchung red, benzidine yellow, Monastral blue, and Monastral green can be used successfully. Strong colors usually require about one part pigment phr; pastels, a much lower amount.

Preparation — Unicellular articles are usually made in a two-stage operation. After thorough and uniform mixing of ingredients, at a temperature less than 120°F, mix is poured or packed into the mold, which is then closed and clamped tightly together.

In the first step, blowing agent is decomposed simultaneously with the fusion of resin and plasticizer. Steam at 75-120 psig is used. Heating time is from 5 to 30 minutes. Since it is accomplished at constant volume, considerable pressure is built up. It is believed that this results in dissolution of nitrogen gas in the mixture.

Product should be cooled below 100°F before press is opened and fused mass is removed. Although partial expansion of the composition occurs after ejection from the mold, a second heating step — softens the material so that a completely expanded sponge can be produced. This step may be conducted in a circulating-air oven or in boiling water. A temperature of 212-220°F must be maintained.

Open-cell PVC Structures

Open-cell structures can be produced at atmospheric pressure in open molds. A cost advantage is obtained since the plastisols can be compounded around monomeric plasticizers alone, when neutral calcium petronate (an oil- and plasticizer-soluble surface-active agent) is used.

In addition to the cost saving, use of monomerics permits formulation of plastisols with minimum viscosities as low as 300-400 cps, and fusion of resin and plasticizer in shorter heating cycles (usually at higher temp) than when polymeric plasticizers are used.

(*Continued on page* 54)

CONSIDER THESE NEW **ACROLEIN DERIVATIVES**

if you need

- a reactive intermediate for chemical syntheses
  - polyester resins
  - plasticizers

PENTANEDIOL-1,5

$HO-CH_2CH_2CH_2CH_2CH_2-OH$

- a cross-linking agent for protein and polyhydroxy compounds
- an intermediate for textile and paper chemicals

GLUTARALDEHYDE (supplied as a stable 30% aqueous solution)

$HCCH_2CH_2CH_2CH$ (O)

- a new reactive monomer— presence of chlorine group in the molecule enhances copolymerization with such materials as vinyl chloride

2-CHLORALLYLIDENE DIACETATE

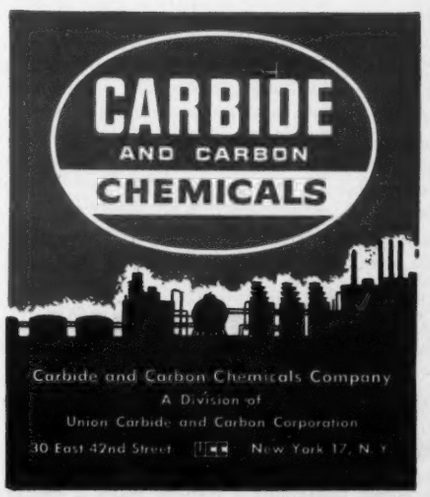
$CH_2=C(Cl)-CH(O-C(=O)-CH_3)(O-C(=O)-CH_3)$

PHYSICAL PROPERTIES	Pentanediol	Glutaraldehyde (30% solution)	Chlorallylidene Diacetate
Boiling Point at 760 mm. Hg	225°C.	101°C.	147.5°C. (100 mm.)
Specific Gravity at 20/20°C	0.9919	1.074	1.213
Vapor Pressure at 20° C.	< 0.01 mm. Hg	17 mm. Hg	0.09 mm. Hg
Freezing Point	—15.6°C.	—6.3°C.	sets to glass below —60°C.

AVAILABILITY—Pentanediol and glutaraldehyde are produced in development quantities. Chlorallylidene diacetate is available in research quantities. As larger requirements for these acrolein derivatives develop, commercial production will be initiated. Acrolein, of course, *is now in commercial production* and is available in tank cars and drums.

Write...

the nearest CARBIDE office for samples and further information so that you can investigate these acrolein derivatives in your own laboratories. Offices in principal cities—in Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal and Toronto.



When inquiring check CP 1045 opposite last page

Chelate more metals

Glyco's ethylenediamine tetraacetic acid (EDTA) and its salts are the most versatile agents on the market for eliminating trace metal contamination. Iron, calcium, magnesium, copper, lead and cobalt are among the troublesome di- and tri-valent ions sequestered.

Salk Vaccine manufacturers specify EDTA to maintain the stability of the vaccine. Detergents for the elimination of radioactive contamination require EDTA. Textile, soap, rubber, paper, insecticide and many other industries are using EDTA in large quantities to overcome their trace metal problems.

Glyco's EDTA and salts – the TETRINE®S – are the purest forms available commercially, from a new plant specially designed to make these products. Plant – products – personnel – all are geared to elimination of your contaminant troubles. Send for samples and our catalog *The TETRINE®S.*

the **TETRINE®S**
Glyco's EDTA

GLYCO Products Co., Inc.
Empire State Building, New York 1, N. Y.
NONIONIC SURFACTANTS • SYNTHETIC WAXES • EMULSIFYING AGENTS

When inquiring check CP 1046 opposite last page

Easily dispersed, highly effective flocculating reagents —

speed-up settling and filtration operations

Find special application where other commonly-used chemicals are not generally effective or are not economical to use

Uses: To improve settling and filtration rates of suspensions and precipitates. Specifically, flocculating reagents are being used in such operations as cyanidation of ores, copper flotation, sulfuric acid leaching of ores, industrial waste treatment, barite production, and sulfide flotation. They are finding special application where other commonly-used chemicals are not generally effective or are not economical to use for improving solid-liquid separation.

Features: Reagents form flocs that settle more rapidly than unconsolidated particles. Clarified supernatent is suitable for reuse or for discarding without creating a solids pollution problem.

Filtering operations are improved by its use. Many cakes are firmed up and filter rates increased up to 150%. In addition, cake washability or percolation rate is improved, cutting soluble losses or improving liquid recovery. Especially with slimy suspensions, ease of discharge of cake from filter is often improved and blinding of the cloth is reduced.

An added advantage is that frequently the use of flocculating reagent in a settling operation will also improve any subsequent filtration.

Description: These flocculating reagents are flaky, dry solids that dissolve in water. They are synthetic polymers consisting of large complex molecules. Several reagents are available, since in many cases one has proven more effective than another, or cheaper to use than another. Very often, however, they can be used interchangeably.

The total concentration required in most applications is in the order of a few hundredths of a pound of reagent per ton of dry solids in suspension. Best results in flocculating suspensions are usually obtained when solutions of about 0.1 to 1% strength are fed to the suspension. Add reagent to water with vigorous stirring.

Solution is added to a slurry or suspension just prior to a settling or filtering operation. Action is very fast, and only a brief — but thorough — mixing is required for complete dispersion. Stage-wise addition may prove more efficient, and any liquid feeding device can be used to meter the solution into a suspension.

In some cases where rapid flocculation of the bulk of suspended solids takes place, a highly colloidal slime fraction may remain suspended in the liquid. A salt such as lime, alum, $CaCl_2$ or NaCl, $FeCl_2$ or $FeCl_3$ added prior to the flocculating reagent may increase effectivenes of flocculation and recovery of the slime fraction.

(Aerofloc Reagents 548, 552, and 3000 are products of Mineral Dressing Dept., American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N.Y. . . . or for more information check CP 1047 on handy form opposite last page.)

Easy-working styrene resin forms high-impact sheet that's heat stable

Trimmed stock can be fed back to mills without regrinding

Uses: Resin is formulated and calendered into sheets which can be post-formed to produce items which are highly resistant to rough usage. Among these applications are refrigerator inner door liners and trays, TV masks, tote boxes, display inserts, meter and business machine housings, aircraft and automotive parts, and toys. Fabrication methods such as vacuum draw forming, vacuum snap-back forming, drape forming, plug and ring forming, blow molding, or line bending of sheet can be used.

Features: Designed primarily as an easy processing calendering resin with excellent heat stability, sheets formulated from the resin have exceptional stiffness and low temp impact. Sheets also exhibit excellent chemical resistance and have good electrical properties.

Ease of processing and forming results in substantial production economy and high product quality. Trimmed stock can be fed back to mills without regrinding and without imparing physical properties. Production economy is realized by the maker of calendered sheet as well as the post former.

Description: Thermoplastic modified high-styrene resin does not require plasticizers, but loaders and fillers may be added if desired during mixing. A wide range of pigments can be used. Color or masterbatches are not necessary, but do facilitate pigment dispersion.

Equipment necessary for processing the resin includes mixers, mills, a 3- or 4-roll calender, take-off, cutters, roll-ups or presses and molds for embossing. After mixing, compound is fed to conditioning mills kept at 300-340°F.

Sheets have a heat distortion point of 190°F @ 66 psi filter stress. Notched Izod impact values of 9.0 ft lb/in of notch can be obtained at room temp, and values around 1.5 at 0°F. Dielectric strength is rated at 442 vpm @ 1 kc.

(Plio-Tuf C75 is a product of The Goodyear Tire & Rubber Co., Inc., Dept. CP, 1144 E. Market St., Akron 16, Ohio . . . or for more information check CP 1048 on handy form opposite last page.)

The alphabetical Product Directory (starting on page 255) will give you a handy page reference to all articles and advertisements.

Dowicide Preservative

helps give fir plywood *enduring* strength for heavy construction uses

Protein glues that laminate structural plywood are kept free of bacterial and fungus attack by addition of Dowicide 7 (Dow PENTAchlorophenol)

Glue-line-treated plywood had a high reuse factor (7-10 times) as concrete forms during construction of Seattle's Alaska Way viaduct.

Builders of modern Tacoma school economically used fir plywood sheets first as concrete forms, then as roof decking.

Once thought purely a decorative facing, fir plywood now competes successfully with other materials in the rugged, high-stress construction field. The great strength these plywood sheets acquire through lamination is protected by Dowicide® 7. This preservative (PENTAchlorophenol) effectively inhibits the growth and action of bacteria and fungi, which could destroy the glue line and cause the plies to separate.

Dowicide Preservatives serve as bactericides, fungicides and germicides in most of the businesses that come to your mind. Fourteen different Dowicides increase manufacturing efficiency or stabilize product quality for paint, textile, petroleum, pulp and paper, agricultural, transportation, leather, floor wax, cordage and many other concerns. *Your* processing, packaging or selling might well benefit through use of one or several Dowicide Preservatives . . . they're *all* marked by high stability, ease of handling and proved effectiveness.

Consultation with Dow's laboratories on individual preservative problems is immediately available. For detailed information, mail coupon to THE DOW CHEMICAL COMPANY, Midland, Michigan.

THE DOW CHEMICAL COMPANY
Dept. DP 655C, Midland, Michigan

Please send me further information on the uses of Dowicide Preservatives.

Name_____
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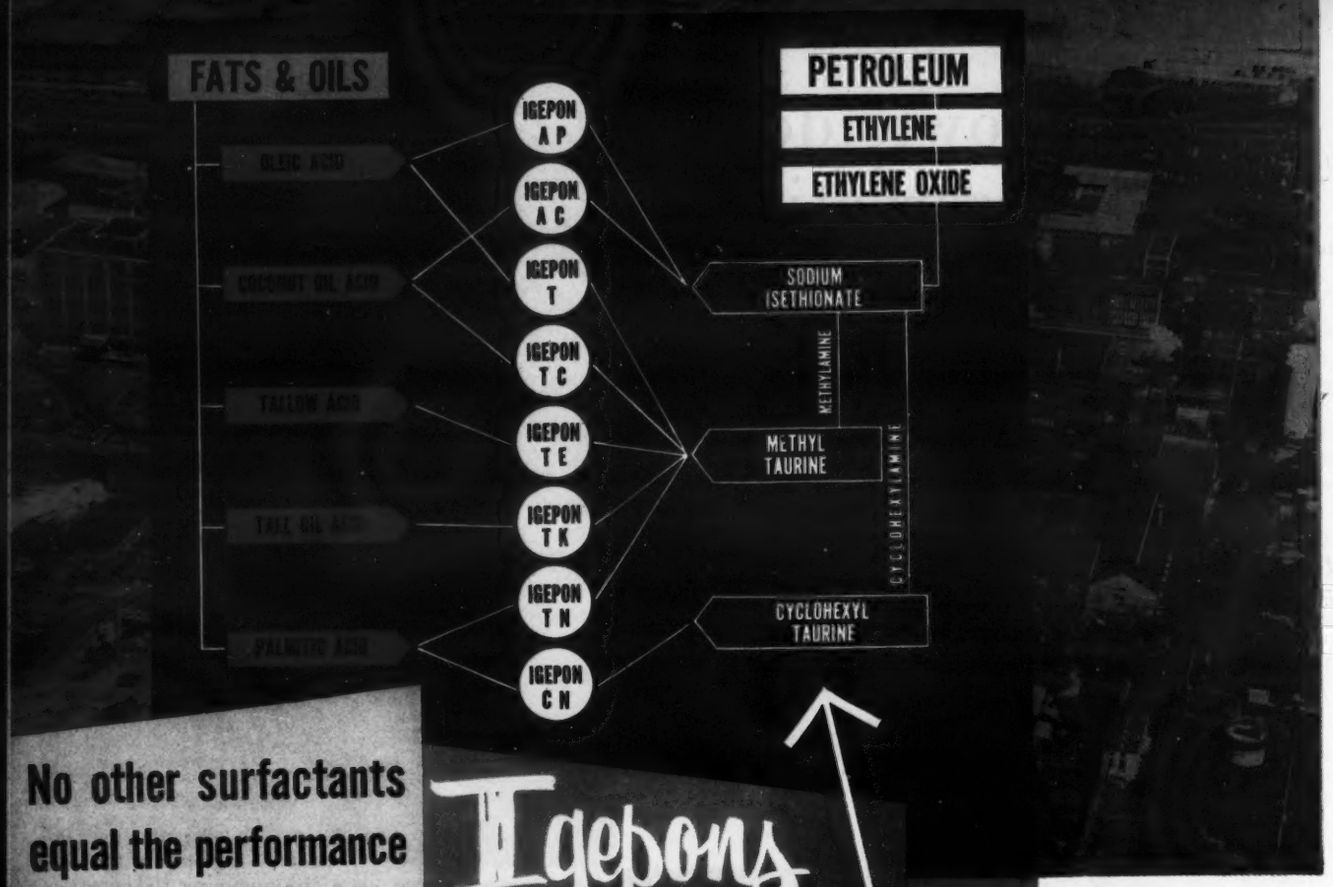
Company_____
Address_____
City_____ Zone____ State_____

FIR PLYWOOD 1905 1955 GOLDEN JUBILEE

you can depend on DOW CHEMICALS

DOW

When inquiring check 1049 opposite last page



No other surfactants equal the performance and versatility of Igepons

Chemical Derivation of Igepon

There are 8 basic Igepons, each supplied in various concentrations and physical forms, and there is one to do the job for you.

Igepons are important in many industries, including cosmetics, textiles, detergents, paper, leather, agricultural and industrial chemicals, to improve a product or process. In some cases, an Igepon is selected because of its high or low foaming characteristics, its unique dispersing or emulsifying qualities, or for its excellent detergency; in others, an Igepon is selected for its wetting power, chemical stability or physical properties.

So whether you're looking for a surfactant in an agricultural wettable powder, a base for laundering detergents, or a bubble bath formulation, check with us on the correct Igepon to use in your particular application.

Write us today for information and samples of these unique, versatile surfactants.

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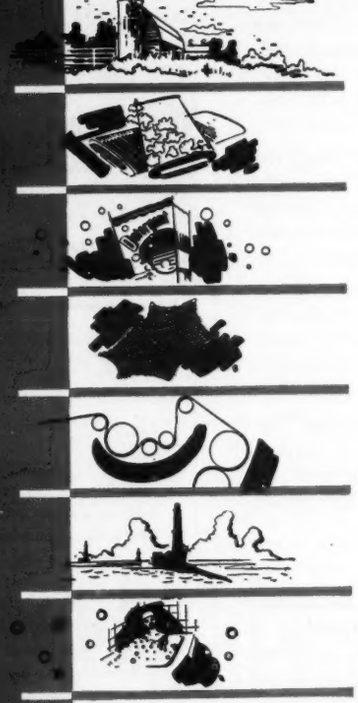


MATERIALS

Helps consistency, stability of Li greases . . .

good over large range of temp, moisture conditions

Uses: For use in making lithium multi-purpose greases.

Features: Helps maintain consistency and stability over a large range of temperature and moisture conditions.

Description: 12-Hydroxy stearic acid has these specs:

Titer (°C)	72-75
Hydroxyl value (min)	154
Iodine value (Wijs)	1-5
Acid number	174-183
Saponification number	185-192

(12-Hydroxy stearic acid is a product of Industrial Oil Dept., Swift & Co., 1800 165th St., Hammond, Ind. . . . or for more information check CP 1050 on handy form opposite last page.)

Makes up into a paint of superior sheen — is easily mixed

Uses: As an alkyd in interior flats.

Features: Product makes up into a paint showing superior sheen, less polishing action after scrubbing, and excellent brushability. In formulating, its compatibility and ease of mixing and grinding are far superior to alkyd vehicles.

Description: Metrolin #209-30 is a pure linseed/resin copolymer.

(Linseed-resin copolymer is a product of Dept. S-29, Brown-Allen Chemicals, Inc., Dept. CP, PO Box I, Staten Island 2, N.Y. . . . or for more information check CP 1051 on handy form opposite last page.)

For more information on product at left, specify CP 1052 . . . see information request blank opposite last page.

Strong solvent power between water and organics makes glycol ethers good mutual solvents . . .

lack of odor, high solvency of products answer many needs

Uses: Compounds find widespread use as solvents, especially in preparation of cleaners, soluble oils, dry cleaning soaps, insecticides, and cutting oil. Other uses include: finishing agents, resin formulations for adhesives, solvents for lacquers and dopes, and dyeing acetate rayons. They are also used in some heavy-duty brake fluids.

Features: Completely soluble in water, materials are at the same time strong solvents for many water-insoluble organics, and thus are used as mutual solvents. They are high potency solvents for certain phenolic and epoxy resins, cellulose esters, and many classes of dyes. They are odorless, and under ordinary commercial conditions handling is relatively easy.

Description: Produced from high-purity ethylene oxide, Poly•Solvs are clear, almost colorless liquids which are miscible with water and most organic solvents. They contain both an ether and an alcohol group, and have these specifications:

Poly • Solv	EM	EE
Compound	Ethylene glycol monomethyl ether	Ethylene glycol monoethyl ether
Boiling range (IBP-DP, °C)	123.5-125.5	132-137
Flash point (open cup, °F)	115	130
Sp gr (20/20°C)	0.963-0.967	0.928-0.933
Color (APHA, max)	15	15
Acidity (wt % as acetic acid, max)	0.01	0.01

EB	DM	DE	DB
Ethylene glycol monobutyl ether	Diethylene glycol monomethyl ether	Diethylene glycol monoethyl ether	Diethylene glycol monobutyl ether
166-173	188-198	185-205	220-235
165	200	205	240
0.900-0.905	1.025-1.031	1.024-1.030	0.953-0.958
15	15	15	15
0.01	0.01	0.01	0.01

Storage in mild steel is satisfactory for a limited time, but a lined container is preferable for longer periods, especially when color requirements are critical. Products are irritating to skin and eyes. Breathing of vapors and contact of liquid with the skin should be avoided.

(Glycol ethers are products of Industrial Chemicals Div., Olin Mathieson Chemical Corp., Dept. CP, Baltimore 3, Md. . . . or for more information about manufacturer's product, reader may simply check CP 1054 on the convenient Reader Service slip which is located opposite last page.)

This offer never expires...

White mineral oils and petrolatums—their development, their manufacture, their use—are our business.

No matter what you make—baby oil, a pharmaceutical ointment, an agricultural spray—if you use white oil or petrolatum in your product or processing . . . we may be of help to you in two ways:

First, we can serve you by supplying you with the type of white mineral oil or petrolatum exactly suited to your specific needs. We'll tailor-make it if necessary.

Second, we shall give you the benefit—in product quality and technical assistance—of more than half a century's concentration on producing better white oils and petrolatums and helping industry use them more profitably.

Because white oils and petrolatums are specifically our business, we believe we have more to offer you—productwise and servicewise—to help you turn out a better product.

We would like you to feel that our door is always open anytime you have any questions concerning white oils or petrolatums. You are always welcome. That is why we say "this offer never expires". Just call or drop a line.

Achieved by Sonneborn RESEARCH

L. SONNEBORN SONS, INC., New York 10, N. Y.

SPECIALISTS IN WHITE OILS AND PETROLATUMS FOR OVER HALF A CENTURY.

When inquiring check CP 1056 opposite last page

Dependable Source for Chemical Raw Materials

Theron S. Dodson plans raw-material purchases to meet Barium Reduction's rising sales needs.

"Wyandotte's reliability helps us serve our many customers better"

– says Theron S. Dodson, purchasing agent, Barium Reduction Corporation, S. Charleston, W. Va.

"The barium chemicals we make are vital to many industries," states Theron S. Dodson, Barium Reduction Corporation. "For example, they are used in the manufacture of television tubes, electric light-bulb sockets, and molded rubber products – also in atomic research. All of these industries have their own peaks and valleys of production, and their demands on us vary.

"As a result, we have to have suppliers who can meet our ever-changing needs for raw materials – and meet them on time. Our suppliers must be able to meet our specifications, too. Anything less than the high-quality we require would only slow up our delivery, or cause trouble for our customers. I can assure you that we always receive excellent service and quality products from Wyandotte. When they say a car of soda ash or caustic soda is shipped, we can schedule our production on it."

Are you seeking a reliable source for chemical raw materials . . . a concern that believes in continuous programs of product development to serve many industries?

If you are, you'll find the people at Wyandotte good people to do business with. Experience with Wyandotte's products will prove their quality consistently uniform . . . and Wyandotte's service to your liking.

Why not talk over your requirements with a Wyandotte representative? You'll find a wealth of technical data available – as well as a willingness to work with you in applying our products to your needs. Or write us, giving as many details as possible about your problem. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

Wyandotte CHEMICALS

Soda Ash • Caustic Soda • Bicarbonate of Soda • Chlorine
Muriatic Acid • Calcium Carbonate • Calcium Chloride
Glycols • Chlorinated Solvents • Synthetic Detergents
Other Organic and Inorganic Chemicals

When inquiring check CP 1057 opposite last page

Vinyl chloride copolymer resin offers compounder latitude in solvent selection . . .

material soluble in ketones, will tolerate aromatic hydrocarbons

Uses: Applications include use in printing inks, strippable coatings, protective liners and coatings for paper, cloth, metal, and other substrates.

Features: Since material is soluble in ketones and will tolerate aromatic hydrocarbons, the compounder is offered considerable latitude in solvent selection.

Description: Vinyl chloride copolymer resin of intermediate molecular weight may be used in solution resin work. Physical properties follow:

Specific Gravity	1.36
Rel. Vis. (1% in Cyclohexanone)	1.80
Bulk Density gm/cc	0.55
Form	powder

Solution of resin may be made by sifting it into solvents under continuous agitation to prevent agglomeration of resin particles. Viscosities, method of application, and time of dry will vary depending upon solvent choice and extending agents used.

(Exon 450 vinyl chloride copolymer resin is a product of Firestone Plastics Co., Div. Firestone Tire & Rubber Co., Dept. CP, 500 Firestone Bldg., Pottstown, Pa. Check CP 1058 opp. last page.)

Insolubilizes polyhydroxy compounds, proteins through cross-linking . . .

hydroxyadipaldehyde is also an intermediate

Uses: In cross-linking and insolubilization of proteins and polyhydroxy compounds. This is important to manufacturers of protein binders, envelope adhesives, glues, and boxboard coatings. Compound is also an intermediate in chemical syntheses.

Features: Material reacts through cross-linking to insolubilize polyhydric materials. Reaction with proteins gives films similar in color and water-resistance to those prepared with glyoxal.

Under proper conditions, the two aldehyde groups and the hydroxyl group can be made to react individually or simultaneously.

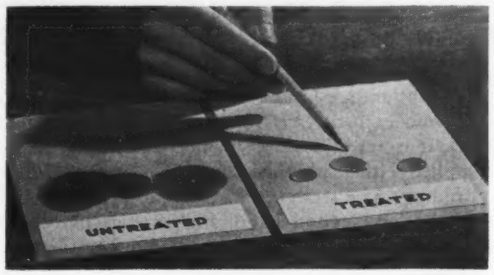
Description: α-Hydroxyadipaldehyde is supplied as a 25% aqueous solution of 1.066 sp gr. Boiling point (50mm Hg) is 37°C; freezing point, −3.5°C. pH is approximately 3.

(Hydroxyadipaldehyde is a product of Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept CP, 30 E. 42nd St., New York 17, N.Y. Check CP 1059 opposite last page.)

Excellent resistance to oil results when paper is treated with fluorochemical . . .

sizing agent does not affect strength or appearance of paper

Uses: Most effective when used on kraft papers, the paper-sizing agent is expected to find wide use in manufacturing grease and oil repellent papers for use in the packaging field — such as machinery parts and oily compounds like putty, caulking compound and sweeping compound.



Sizing agent can also be used in laminated and coated paper constructions as a means of preventing "bleedback." It can also be used to provide oil and grease-resistance for fiber drums, paper board containers, and paper specialties.

Features: Paper produced with chemical sizing agent has excellent resistance to oily and greasy materials. Strength, porosity, flexibility, appearance, or color of the material are not affected.

Description: Paper-sizing agent is based on a fluorochemical compound. Material is used in a water solution and is sprayed on the moving web of paper or applied as it passes through the size press. It can be used in most paper production lines with existing equipment.

(Scotchgard paper-sizing agent is a product of Minnesota Mining and Manufacturing Co., Dept. CP, 900 Fauquier St., St. Paul 6, Minn. . . . or for more information check CP 1060 on handy form opposite last page.)

Synthetic pharmaceutical, organic chemicals

Structure, form, description, properties of 51 chemicals and pharmaceutical intermediates are issued in a 6-page folder designed for easy reading.

"Synthetic Organic and Pharmaceutical Chemicals" is issued by National Aniline Div., Allied Chem. & Dye Corp., Dept. CP, 40 Rector Street, New York 6, N. Y. When inquiring check CP 1061 on handy form which is located opposite last page.

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Mathieson ethanolamines are produced from high purity ethylene oxide and ammonia of our own manufacture. Rigid quality controls from basic raw materials to finished product assure uniform high standards.

Tank car, tank truck, and drum shipments can be made from the Doe Run Plant at Brandenburg, Kentucky.

For technical information and samples, call your Olin Mathieson representative or write today.

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When inquiring check CP 1062 opposite last page

✓ Industry wipes out corrosion with Firestone Exon Resins

NEW PVC "SANDWICH" starves out corrosion!

High speed silver plating solutions are not only corrosive, but they must also be kept free from contamination to perform satisfactorily. Various plasticized types of coatings were quickly corroded by the special inorganic addition agent in the silver solution. Unplasticized PVC was suitable, but could not be bonded to a steel tank.

Comco, Inc., New Haven, Connecticut, solved this problem for General Electric Company's Philadelphia Switchgear Plant by fabricating a huge hot-rolled steel plate tank able to support the 200 gallons of special silver plating solution and lined it with VYFLEX FL-85.*

This remarkable lining, only .085" thick is actually two sided. One side is rigid Unplasticized PVC made of Exon 402-A resin, which is exposed to the silver plating solution stopping corrosion and preventing contamination. Its back is Plasticized PVC based on Exon 900 series resin, which, by being laminated to the Unplasticized PVC, makes possible the lining of metal tanks with Unplasticized PVC, and overcomes the varying rates of expansion between PVC and steel.

Another proof of how effectively a corrosion problem can be solved by the unusual versatility of resins engineered by Firestone.

***Flexible PVC bonds Rigid PVC to steel tank*—permanently!**

Firestone

EXON®

*Vyflex FL-85 is made from Exon resins *Product of Kaykor Industries, Inc. Division of Kaye-Tex Mfg. Corp., Yardville, N.J.

The simple fact is: *You* can stop corrosion. EXON PVC resins are the bases for a wide variety of corrosion controlling materials. In the form of lightweight structural rigids, linings or coatings, these versatile materials differ in properties, each one of them geared to solve a different, specific corrosion problem. For details that will interest you in particular, call or write:

CHEMICAL SALES DIVISION
FIRESTONE PLASTICS COMPANY, DEPT. 8V, POTTSTOWN, PA.
A DIVISION OF THE FIRESTONE TIRE & RUBBER COMPANY

When inquiring check CP 1063 opposite last page

Improves breaking strength and gives soft hand on synthetic fibers . . .

cationic softener is non-yellowing, disperses readily without precipitating ingredients

Uses: As a softener that's highly effective in the Avcoset process on rayons and rayon blends. It is also very good on nylon, Dacron, Orlon, Dynel, and other synthetic fibers.

Features: Non-yellowing softener gives a soft hand with improved breaking strength and sewability when 1-3% is added directly to Avcoset mix. It disperses readily in mix without precipitating any ingredients. It exhibits high antistatic characteristics when used as straight finish.

Description: Called Ampitol VAC, softener is cationic in nature, is supplied as a straw-colored gel. It is readily soluble in hot water, and can be applied either by the exhaustion method or by padding. As a straight finish, 0.5 to 2% (on wt of goods) gives good hand, high static control. In padding, 0.5 to 2% on wt of liquor is recommended.

(Cationic softener is a product of Textile Chemical Div., Dexter Chemical Corp., Dept. CP, 819 Edgewater Rd., New York 59, N.Y. . . . or for more information about manufacturer's product reader may simply check CP 1064 on handy form opposite last page.)

Pharmaceutical, agricultural, industrial products from organic intermediates . . .

benzyl ethylene oxide, benzyl ethylene glycol, and 1-chloro-3-phenyl-2-propanol

Three organic intermediates commercially available are benzyl ethylene oxide, benzene ethylene glycol, and 1-chloro-3-phenyl-2-propanol. Relatively simple in structure, they have not been investigated to any extent.

Many of their derivatives have pharmacological activity. In the agricultural field, the mercapto derivatives or sulfones should be evaluated as synergists and biocidal agents.

Benzyl ethylene oxide is suggested as a stabilizer for chlorinated hydrocarbons and as an active diluent for epoxy resins. Dioxolanes or cyclic acetals from benzyl ethylene glycol may have value as perfume ingredients.

(Organic intermediates are available from Millmaster Chemical Corp., Dept. CP, 11 W. 42nd St., New York, N.Y. . . . or for more information check CP 1065 on handy form which is located opposite last page.)

Plasticizer has lower viscosity

Uses: As a secondary plasticizer for PVC resins.

Features: Material provides substantially lower viscosity than normal 40% chlorinated paraffins. Approaching that of primary plasticizers in present general usage, viscosity falls in the five poise range at 25°C, facilitating easier plant handling.

Description: Known as Chlorowax LV, material is a modified liquid chlorinated hydrocarbon.

(Chlorowax LV is a product of Chlorinated Products Div., Diamond Alkali Co., Dept. CP, 300 Union Commerce Bldg., Cleveland 14, Ohio . . . or check CP 1066 opposite last page.)

Cures epoxy resins

Modified amine curing agent is particularly useful in low mw epoxy castings, potting and adhesives and laminating applications where room temp or moderately elevated temp cures are desired.

(Amine curing agent is a product of Shell Chemical Corp., Dept. CP, 50 W. 50th St., New York, N.Y. Check CP 1067 opposite last page.)

Adds plasticizer to line

Di iso decyl phthalate plasticizer for vinyls gives low volatility, good permanence, low-temp flex, and an economy resulting from its low sp gr. Called PX-120, it is a product of Pittsburgh Coke & Chemical Co., Dept. CP, 1970 Grant Bldg., Pittsburgh 19, Pa. . . . or check CP 1068 opposite last page.

For more information on product at right, specify CP 1069 . . . see information request blank opposite last page.

NOW from National Aniline

Comprehensive Product-Data on Tolylene Diisocyanates

NATIONAL NACCONATES*

To encourage further exploration and application of these versatile polymer-forming intermediates, we now offer a comprehensive "product-data package" on National NACCONATES. This new data comprises a basic technical brochure on diisocyanates plus five technical bulletins, viz

Bulletin I-17—"NACCONATES" contains 24 pages of fundamental data on diisocyanates as a class, including 12-pages covering 27 principal generic reactions (with amines, hydrazines, alcohols, carboxylic acids, etc., etc.) ; 8 pages of suggested uses plus a bibliography of 132 literature references applying thereto. Literally, it is a condensed, timely textbook for research and product development men.

Bulletin I-17A—NACCONATE 80 Four pages of specific data on National Aniline's mixture of approximately 80% of 2,4-tolylene diisocyanate and 20% of 2,6-tolylene diisocyanate. This bulletin includes properties, suggested uses, physiological data and a significant infrared spectogram on NACCONATE 80.

Bulletin I-17B—NACCONATE 65 includes data on National's mixture of approximately 65% of 2,4-tolylene diisocyanate and 35% of 2,6-tolylene diisocyanate.

Bulletin I-17C—NACCONATE 100 gives corresponding product data on National's 2,4-tolylene diisocyanate.

Bulletin I-17D—NACCONATE 200 covers National's 3,3′-bitolylene 4,4′-diisocyanate.

Bulletin I-17E—NACCONATE 300 covers National's diphenylmethane 4,4′diisocyanate.

NATIONAL ANILINE DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

Boston Providence Philadelphia Chicago San Francisco Portland, Ore. Greensboro Charlotte Richmond Atlanta Los Angeles Columbus, Ga. New Orleans Chattanooga Toronto

In view of our desire to handle requests in the order of their urgency, we ask that you fill out the coupon and attach it to your Company's letterhead.

Please send your 6 technical bulletins on NACCONATES. I am

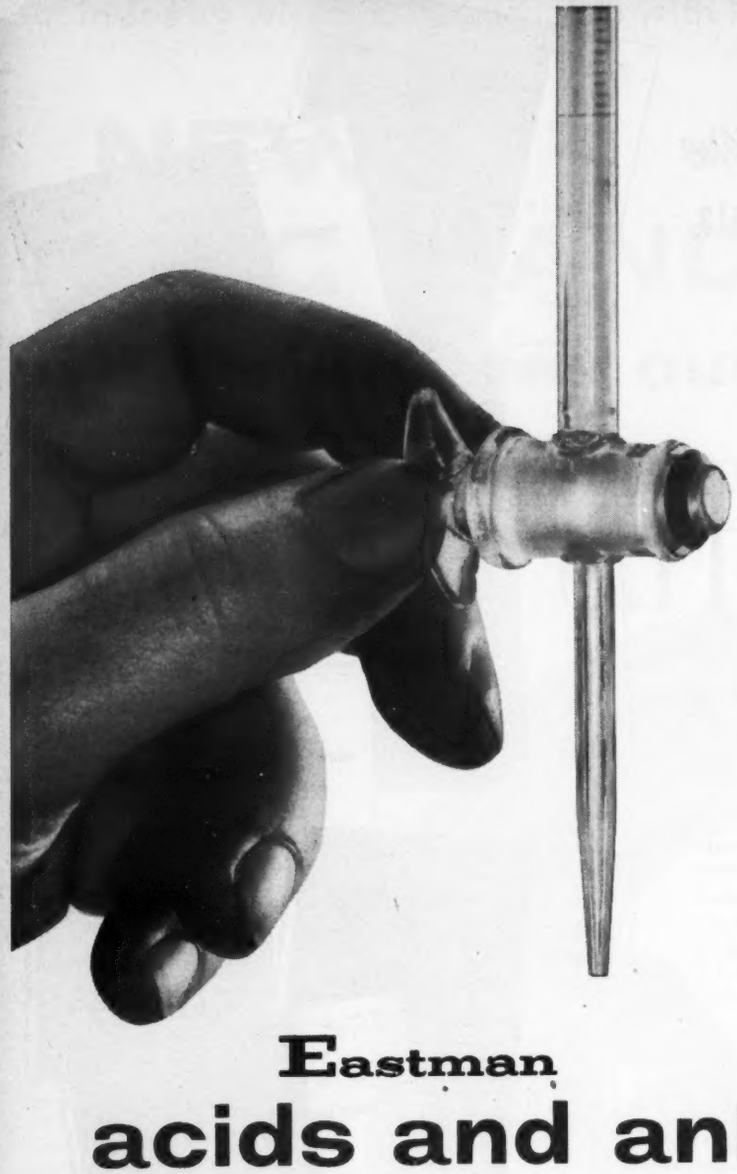
- ☐ now working with diisocyanates.
- ☐ working in areas where diisocyanates may have applications
- ☐ broadly interested in background data on diisocyanates.

Name:_____

Position:_____

Company:_____

Address:_____



acetic acid

- Organic synthesis
- Reaction medium and solvent
- Dyeing assistant

acetic anhydride

- Acetylating agent
- Dehydrating agent in nitration and sulfonation reactions, etc.

propionic acid

- Organic synthesis

propionic anhydride

- Acetylating agent
- Intermediate

n-butyric acid

- For the preparation of butyric esters useful in formulating perfumes and flavorings.

n-butyric anhydride

- Acylating agent
- Intermediate

Eastman acids and anhydrides

Eastman acids and anhydrides have been called "the standard of the industry." Let their uniformly high quality simplify the control of your processing operations. For more information, samples or specifications, write to Eastman Chemical Products, Inc., Chemicals Division, Kingsport, Tennessee.

Eastman
CHEMICAL PRODUCTS, INC.,
KINGSPORT, TENNESSEE
subsidiary of
EASTMAN KODAK COMPANY

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tenn.; New York—260 Madison Ave.; Framingham, Mass.—65 Concord St.; Cincinnati—Carew Tower; Cleveland—Terminal Tower Bldg.; Chicago—360 N. Michigan Ave.; Houston—412 Main St.; St. Louis—Continental Bldg. **West Coast: Wilson Meyer Co.,** San Francisco—333 Montgomery St.; Los Angeles—4800 District Blvd.; Portland—520 S. W. Sixth Ave.; Salt Lake City—73 S. Main St.; Seattle—821 Second Ave.

When inquiring check CP 1070 opposite last page

Uniform, white white nylon is workable with heat, easy to dye . . .

comes as filament yarn, staple fiber, and tow

Uses: As a nylon filament yarn, staple fiber, and tow available to textile mills.

Features: Nylon has excellent affinity for all classes of dyestuffs used on nylon, and is outstanding in affinity for the acid, direct, premetallized acid, chrome and vat groups. The fiber is white white, uniform, and strong. Since it is workable with heat, practical advantages of heat-setting at low temperatures, shorter conditioning cycles, reduced lag periods, and less inventories are obtained.

Description: Caprolan deep-dye nylon is of the polycapramide type, and is the result of a ten year research project. It is supplied in regular and high tenacities. The regular is supplied as staple in standard deniers in any length, with tensile strength of 70,000-79,000 psi; and as filaments (under 2000 denier) with tensile strengths of 73,000 to 87,000.

The high tenacity is supplied as filaments (tensile strength: 109,000 to 120,000 psi) and heavy yarns (2000 to 50,000 denier) with tensiles from 87,000 to 106,000 psi. Sp gr is 1.14. Water absorbency is 7.8% at 95% RH.

(Caprolan nylon is a product of National Aniline Div., Allied Chemical & Dye Corp., Dept. CP, 261 Madison Ave., New York 16, N.Y. . . .or for more information about manufacturer's product reader may simply check CP 1071 on handy form opposite last page.)

Wax beads are easily measured, poured, and readily mixed in rubber formulations . . .

beads will not gum or stick together in hot weather or hot mill rooms

Waxes are ordinarily added to rubber compounds to help protect them from sunlight and attack by oxidizing agents. Manufacturer furnishes its blends of waxes in form of wax beads. These are readily mixed with other components, and are easily measured and poured, and mix much more quickly. They will not gum or stick together in hot weather or in hot mill rooms. Special blends can be furnished on specification.

(Wax beads are a product of American Maintenance Supply Co., Dept. CP, 236 W. North Ave., Chicago 10, Ill. . . . or for more information check CP 1072 on handy form which is located opposite last page.)

Dial fatty acid specifications

Set dial to code number of manufacturer's fatty acids and the specifications and composition of that acid appear in appropriate windows. Twenty-two products are covered. On reverse side are temperature and color conversion charts.

"A Guide to Better Fatty Acids" is issued by Wilson-Martin Div., Wilson & Co., Dept. CP, Snyder Ave. and Swanson St., Philadelphia 48, Pa. Specify CP 1073 opposite last page.

High tensile, high tear imparted by utility oil furnace black

All-around utility oil furnace black has high tensile and high tear properties, excellent processing characteristics. Reinforcing properties are superior to SRF grades. Black is equally good for tires and mechanical goods.

(Arogen GPF black is a product of J. M. Huber Corp., Dept. CP, 100 Park Ave., New York 17, N.Y. . . . or for more information check CP 1074 opposite last page.)

Chemical shows promise as weed killer

Experiments show 3-amino-1,2, 4-triazole, a chemical previously used in photographic film manufacture, makes a good weed killer for quackgrass, nutgrass, and Canada thistle. Chemical works by interfering with weed's chlorophyll supply.

(Amizol is a product of American Chemical Paint Co., Dept. CP, PO Box 301, Ambler, Pa. . . . or for more information check CP 1075 opposite last page.)

For more information on product at right, specify CP 1076 . . . see information request blank opposite last page.

STANNARD ROCK LIGHTHOUSE, Lake Superior, Michigan, is located about 23 miles southeast of Manitou Island. Completed in 1883, the stone tower is built on a base of concrete and stone which stands on solid rock in 11 feet of water. The light, 102 feet above water and visible for 18 miles, protects shipping in a dangerous area on the heavily traveled trade route between Duluth and the lower lakes.

Protection for the quality of your products and the efficiency of your processes is provided by the uniformly high standards of Niagara Alkali Company products. Depend on the purity and uniformity of Nialk® Liquid Chlorine, Nialk Caustic Potash, Nialk Carbonate of Potash, Nialk Paradichlorobenzene, Nialk Caustic Soda, Nialk TRICHLORethylene, Niagathal® (Tetrachloro Phthalic Anhydride).

NIAGARA ALKALI COMPANY

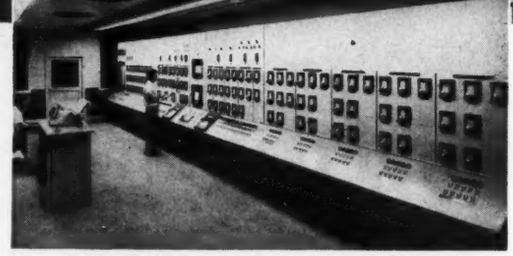
60 East 42nd Street

New York 17, N.Y.

NITROPARAFFINS on Stream!

WORLD'S FIRST COMMERCIAL NITROPARAFFIN PLANT NOW IN PRODUCTION

Shipments are now being made from Commercial Solvents Corporation's new plant at Sterlington, Louisiana. Completely designed by CSC engineers, the new plant marks a major step in the company's long-term petrochemical development. The new facilities will produce over 10 million pounds of four basic nitroparaffins – Nitromethane, Nitroethane, 1-Nitropropane, and 2-Nitropropane. In addition, the new plant will turn out multi-million pound quantities of the derivatives listed at right, many of which have achieved outstanding industrial usefulness. This unique family of chemicals opens up entirely new fields with extraordinary potential for all industry.



Control panel contains over 100 miniature recorders and controllers. A unique data reduction unit continually scans and records all operating conditions.

BASIC NITROPARAFFINS

Nitromethane Nitroethane 1-Nitropropane 2-Nitropropane

NITROPARAFFIN DERIVATIVES

Alkaterges
Aminohydroxy Compounds (AMP; AMPD)
Chloronitroparaffins
Diamines
Hydroxylamine Salts (HAS; HS)
Nitrohydroxy Compounds

For full technical data and samples, write to:

COMMERCIAL SOLVENTS CORPORATION
260 MADISON AVENUE, NEW YORK 16, N. Y.

CSC INDUSTRIAL CHEMICALS

When inquiring check CP 1077 opposite last page

Low-volatile phthalate plasticizer resists water extraction, and "rub-off" . . .

didecyl phthalate made from Oxo alcohols

Uses: As a plasticizer in the vinyl plastics industry.

Features: The least volatile of commercially-available phthalate plasticizers, compound has improved resistance to water extraction and plasticizer "rub-off." In plastisols, it contributes better viscosity stability. Excellent heat and light stability, and good electrical properties are other attributes.

Description: Called Flexol plasticizer 10-10, compound is didecyl phthalate, and is made from Oxo alcohols at company's recently opened Texas City, Texas, plant.

(Didecyl phthalate is a product of Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. Check CP 1078 opposite last page.)

Masks objectionable odors emanating from chemical, pharmaceutical, municipal waste operations . . .

have low-temp stability, greater coverage of sulfide and mercaptan odors

Reodorants have proven their effectiveness in masking objectionable odors emanating from municipal waste, chemical plant operations, and pharmaceutical and biotic wastes. They have improved low temperature stability, with greater odor coverage of sulfides and mercaptans. Addition can be made directly to processes or applied in dispersible form to effluents from operations.

(Alamask P4-M and P4-M-X are products of Engineering Section, Rhodia, Inc., Dept. CP, 230 Park Ave., New York 17, N. Y. . . . or for more information check CP 1079 on handy form opposite last page.)

Progress in manufacture of aluminum pastes

A quarter century of progress in making aluminum pastes is shown in 12-page illustrated brochure. Hall Paste Process briefly described.

"25 Years of Progress in the Manufacture of Aluminum Pastes" is issued by Metals Disintegrating Co., Inc., Dept. CP, 1170 Arthur Blvd., Elizabeth, N.J. When inquiring specify CP 1080 on handy form opposite last page.

Interesting configuration of thiodiglycolic acid gives many uses . . .

has two carboxyl groups, thioether linkage

Thiodiglycolic acid should be an effective intensifier for weed-killing compositions; an excellent stabilizer for hydrazine derivatives, for fatty substances against oxidative deterioration, and for aldehydes against auto-oxidation. Treatment of epoxyhydroxy polyether resins with this acid should result in production of hard films, possibly of greater stability than those obtained by using diglycolic acid.

The acid, $HOOC\text{-}CH_2\text{-}S\text{-}CH_2\text{-}COOH$, is very soluble in water and ethanol, insoluble in benzene. Specs include:

Assay (%, min)	98.5
Ash (%, max)	1.5
Melting point (°C, min)	128

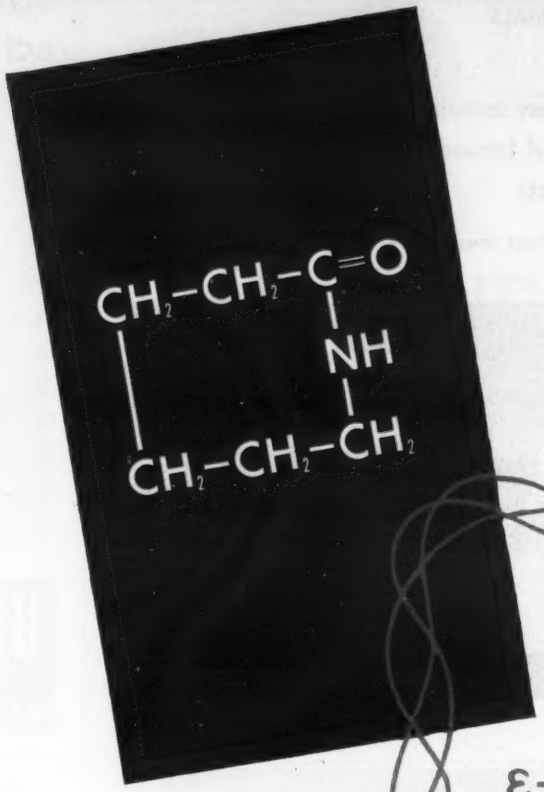
Toxicity tests show that an oral administration of a 25% aq solution of this compound to laboratory animals had an LD_{50} of 1.23 gm/kg on guinea pigs, 1.86 gm/kg on rabbits, and 3.40 gm/kg on rats.

(Thiodiglycolic acid is a product of Evans Chemetics, Inc., Dept. CP, 250 E. 43rd St., New York 17, N.Y. . . . or for more information check CP 1081 on handy form which is located opposite last page.)

Electron micrographs of MoS_2 flakes

Single-page data sheet shows five electron micrographs of molybdenum disulfide flakes for lubricants. One view is a 24,000:1 magnification. It shows the hexagonal structure and planes of cleavage which account for lubricity.

Field Report 138a is issued by The Alpha Molykote Corp., Dept. CP, 65 Harvard Ave., Stamford, Conn. Specify CP 1082 opposite last page.



National Aniline Announces

First American Tonnage Production

of an interesting reactive intermediate

NATIONAL®

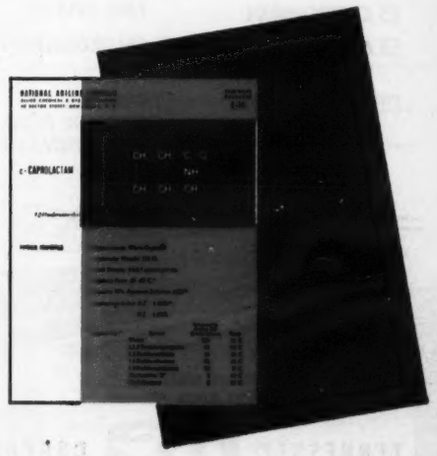
ε-CAPROLACTAM

(2-Oxohexamethylenimine)

Available for the first time in large tonnage, this high-purity ε-Caprolactam should find important uses in new organic chemical developments. Our modern Hopewell, Va. plant has ample production to supply projected requirements and our output can be further expanded to meet any foreseeable commercial need at attractive volume prices.

WRITE FOR TECHNICAL BULLETIN I-14

To assist prospective users of this unusual 6-carbon chemical, National CAPROLACTAM, we have prepared a 12-page brochure containing complete physical properties, known chemical reactions, suggested uses, and a bibliography. Samples and additional technical help are freely available to those whose work may develop new uses for National CAPROLACTAM.



NATIONAL ANILINE DIVISION

ALLIED CHEMICAL & DYE CORPORATION

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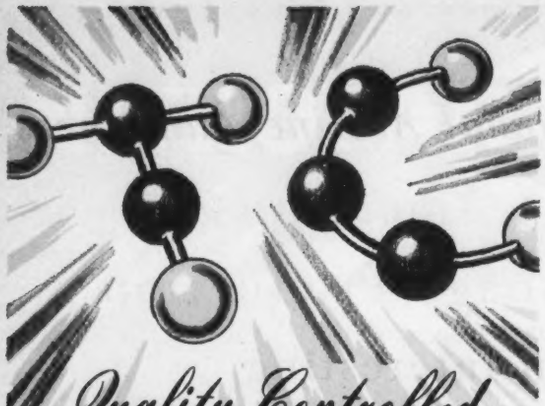
When inquiring check CP 1083 opposite last page



Quality Controlled

CHEMICALS FOR INDUSTRY

As basic producers of Copper, Iron, Zinc and Sulfur, we maintain exacting ***QUALITY CONTROL*** from the raw material to the finished product. You can be assured of ***UNIFORM QUALITY*** if it bears the **TC** label.

Check Tennessee's

- ☐ COPPER SULFATE
- ☐ MONOHYDRATED COPPER SULFATE
- ☐ COPPER CARBONATE
- ☐ COPPER HYDRATE
- ☐ CUPRIC CHLORIDE
- ☐ CUPRIC OXIDE
- ☐ MANGANESE SULFATE
- ☐ MONOHYDRATE MANGANESE SULFATE
- ☐ MANGANESE OXIDE
- ☐ MANGANESE CARBONATE
- ☐ FERRIC SULFATE
- ☐ SULFUR DIOXIDE
- ☐ MONOHYDRATED ZINC SULFATE
- ☐ CHLOROSULFONIC ACID
- ☐ ORGANIC SULFONIC ACIDS (AND DERIVATIVES)

Samples, specifications and detailed information upon request.

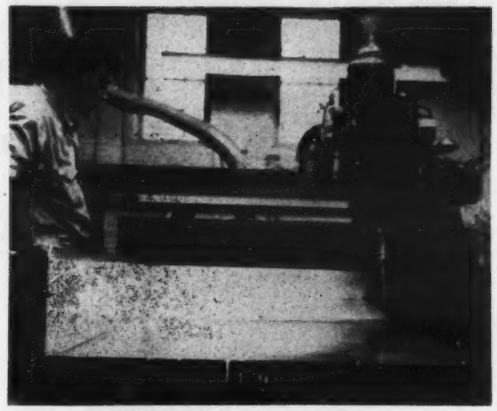
TENNESSEE TC CORPORATION

617-29 Grant Building, Atlanta, Georgia

When inquiring check CP 1084 opposite last page

It's easy to control density, color of foamed urethane products

Fast machinery, conventional tools used



Forming

Cutting

1) Machinery converts liquid isocyanates and polyesters into flexible urethane foams in less than four minutes. Mixing head spreads liquid, moves across mold which is traveling into machine. Foaming action starts immediately. Mold is waxed so foam won't stick, can be removed.

2) Easily fabricated with simple tools, foam is shown being shaped by a band saw. Slitting can be accomplished by a horizontal saw, similar to those used to split leather. Foams are fire resistant, can have densities from 1½ to 6 lb/cu ft.

activated carbons for SOLVENT RECOVERY

ADSORBITE® activated carbons are everyday recovering practically every known solvent used in commercial quantities.

We furnish new carbons for both new and existing systems. Many types of used carbons can be reactivated to their original adsorptive capacity and re-used at a fraction of replacement cost.

Want further information? Tell us about your solvent recovery system, let us show you what we can do.

BARNEBEY-CHENEY Company

CASSADY AT EIGHTH COLUMBUS 19, OHIO

In Canada: BARNEBEY-CHENEY LTD., St. Johns, Quebec

When inquiring check CP 1085 opposite last page

Where can you use these high-purity chemicals?

Ammonium Paratungstate	Phosphotungstic Acid
Barium Carbonate	Potassium Silicate
Calcium Carbonate	Silicon
Germanium	Sodium Sulphate
Germanium Dioxide	Sodium Tungstate
Molybdenum	Strontium Carbonate
Phosphors,	Tungstate Acid
(TV tube,	Tungstic Acid
CR tube, lamp)	Tungstic Oxide

Write for technical information

SYLVANIA ELECTRIC PRODUCTS INC.
1740 Broadway, New York 19, N. Y.
In Canada: Sylvania Electric (Canada) Ltd.
University Tower Bldg., St. Catherine St., Montreal, P. Q.

SYLVANIA®

When inquiring check CP 1086 opposite last page

Inspecting finished cushion

3) A completed product is inspected. This one is an aircraft seat cushion. It will give long-lasting service and save several pounds over conventional cushions. Product is made in a wide variety of colors.

(Components of urethane foams are products of Mobay Chemical Co., Dept. CP, 1700 S. Second St., St. Louis 4, Mo. . . . or for more information check CP 1087 opposite last page.)

Makes delamination difficult . . .

phenolic laminating varnish has good bonding properties, high strength, heat resistance

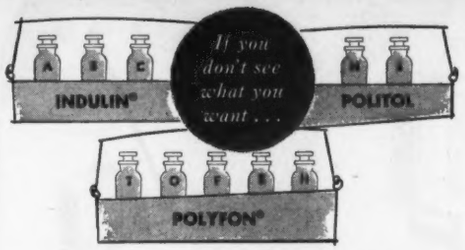
Uses: As a varnish in glass cloth laminates.

Features: Not only does varnish produce high-strength, heat-resistant laminates but these laminates are difficult to delaminate. It is especially good where low-pressure cures are used, for example, around 30 psi.

Description: Plyophen 5592 is a phenolic laminating varnish. Typical properties of a glass cloth laminate made with 181 glass cloth with Volan "A" treatment and containing 35-37% resin and 2.7-3.5% volatiles are shown below. Test panels were cured at 30 psi and 325°F for 20 minutes.

Flexural strength (10^3 psi)	63-71
Modulus of elasticity (10^6 psi)	2.7-3.1
Compressive strength (10^3 psi)	40-43
Tensile strength (10^3 psi)	43-46
Water absorption (1x3" sample, 14 days @ room temp, %)	0.184

(Phenolic varnish for glass laminates is a product of Reichhold Chemicals, Inc., Dept. CP, 525 N. Broadway, White Plains, N. Y. . . . or for more information check CP 1088 opposite last page.)



ASK FOR IT!

Our standard forms of pine wood lignin—INDULIN and POLYFON—solve most processing problems on dispersion, stabilizing, binding, extending, dye-leveling and ion sequestering.

But if your process requires a special material for special conditions, our laboratories will formulate to your needs, and our plant will turn it out by the ton. We developed POLITOL for purifying fats and oils in this way, and are working on other new products.

Send for literature and test samples on these plentiful, inexpensive surface-active agents. Then, if you don't find what you want, ask our technical people for special service.

Polychemicals DIVISION

West Virginia Pulp and Paper Company

CHARLESTON A, SOUTH CAROLINA

When inquiring check CP 1089 opposite last page

GELLING and THICKENING AGENTS IMPROVED . .

Morningstar SCIENTIFIC STARCH and WATER SOLUBLE GUM SERVICE

WATER SOLUBLE GUMS
Agar-Agar
Gum Arabic
Gum Karaya
Locust Bean Gum
Gum Tragacanth
Irish Moss

STARCH PRODUCTS
Arrowroot Flour
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Tapioca Flour
Instant Pudding Base
Precooked Starches
Dextrines—
Yellow and White

We manufacture laboratory controlled Water Soluble Gums and Starch Products. Our years of experience in developing and supplying these products for the most quality conscious firms in your industry, can be useful to you. Tell us your needs. Our modern line is sure to answer your problems.

SEND FOR our Water Soluble Gum Inquiry Sheet. You fill in and return it for analysis and recommendations.

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When inquiring check CP 1090 opposite last page

PICCOUMARON
Para-Coumarone-Indene
RESINS
Provide skillfully balanced properties

PICCOUMARON Resins are *compatible* with most other resins, waxes, coal tar residues, oils, rubber and other materials; *soluble* in coal tar, turpentine and terpene solvents; *resistant* to most acids, alkalies, salts.

Available in ten melting points, from a liquid to a hard brittle solid. Colors, from pale yellow to dark reddish brown.

Send for complete data and samples.

Pennsylvania Industrial Chemical Corp. CP
Clairton, Pennsylvania
Please send bulletin and samples of Piccoumaron for
(application)_____
Name_____Position_____
Company_____
Address_____

Pennsylvania Industrial Chemical Corp.
CLAIRTON, PENNSYLVANIA
Plants at:
Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.
District Sales Offices
New York, Chicago, Philadelphia, Pittsburgh, Detroit

When inquiring check CP 1091 opposite last page

...you'll want to use A-C* Polyethylene

How long have you looked for a way to get the outstanding values of polyethylene with the convenience of wax? And how many types of "poly" did you try before giving up?

Well, consider polyethylene again. But this time try *low-molecular-weight* A-C POLYETHYLENE —regular or emulsifiable!

Here's why:

- **handles at temperatures of wax in conventional equipment.**
- **gives a high gloss, enhances and adds richness to colors, improves scuff and abrasion resistance.**
- **is completely compatible with all waxes and actually fortifies all your wax formulations.**
- **permits close control of coating weight.**
- **easier to use, easier to handle. You can use higher percentages of A-C POLYETHYLENE on standard coating equipment.**

*Trade Mark

Don't delay! Commercial quantities are available for your immediate evaluation. Write for free samples today or return the handy coupon with your business letterhead.

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40 Rector Street, New York 6, N. Y.

Allied Chemical

- ☐ Please send me technical literature on A-C POLYETHYLENE.
- ☐ Please send me free samples of A-C POLYETHYLENE.
- ☐ My proposed use of A-C POLYETHYLENE is:

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Company_____

Address_____

City_____ State_____

Type of Business_____ CP-10

When inquiring check CP 1092 opposite last page

VINYL STRUCTURES

(*Continued from page* 39)

Preparation — Several dispersion-grade PVC resins work successfully, but lab tests show Geon 121 resin with "L" lot numbers gives consistently good results. Because moisture in plastisols contributes to poor cell structure, it may be necessary to dry resins prior to use if they have been stored where there's high humidity.

A smooth, creamy dispersion insures a sponge of uniform cell size. Lab work shows optimum results are obtained when a water-cooled, three-roll mill is used for mixing. Temperatures greater than 120°F should be avoided. A number of formulations have been tested.

Formulations of both closed-cell and open-cell structures are shown in table.

(BL-353 blowing agent is a product of Explosives Dept., E. I. duPont de Nemours & Co., Inc., Dept. CP, Wilmington 98, Del. . . . or check CP 1093 on handy form opposite last page.)

Temperatures of 198-204°F will not heat distort styrene compound

Uses: Recommended for applications where high heat resistance is desirable, such as radio cabinets and stand-by battery cases.

Features: Plastic can tolerate temperatures of 198-204°F with no heat distortion.

Description: Lustrex Hi-Heat 99, a styrene molding compound, is available in colorant blend and pelleted crystal, standard and special colors.

(Heat-resistant styrene molding compound is a product of Plastics Div., Monsanto Chemical Co., Dept. CP, Springfield, Mass. . . . or for more information check CP 1094 opposite last page.)

Pigmentation of butadiene-styrene latex emulsion paints studied

Major purposes of 22-page technical report are 1) study of rheological and dry film properties of various extended pigments in latex paint series, 2) determination of various critical pigment volume concentrations in this type of paint, 3) coloration of this critical concentration with some of the extender's fundamental properties. Three pages of tables and seven pages of figures and graphs accompany the text.

Technical Report 31-T is issued by Sierra Talc & Clay Co., Dept. CP, P.O. Box 390, 1608 Huntington Dr., S. Pasadena, Calif. When inquiring check CP 1094A opposite last page.

Has powerful solvent-action for vinyl chloride-acetate resins . . .

used in nearly all vinyl metal finishes applied by roll-coating techniques

Uses: As a solvent for inks and stencil pastes. It is included in nearly all vinyl metal finishes applied by roll-coating. It is also a chemical intermediate.

Features: A good solvent for many kinds of resins as well as natural fats, oils, gums, and waxes, compound has slow evaporation rate.

Description: Isophorone, 3,5,5-trimethylcyclohexene-2-one-1, is an unsaturated, cyclic, high-boiling ketone that is only slightly soluble in water. It reacts with aldehydes, amines, and substituted nitrogen derivatives. Double bond makes addition of halogens, mercaptans, and halogen acids possible. Such products as chemicals for rubber inhibitors, plasticizers, and flotation agents can be made.

It has powerful solvent-action for vinyl chloride-acetate resins, and most other synthetic resins. Specifications:

Sp gr. (20/20°C)	0.920-0.925
IBP (°C @ 760mm Hg, min)	205
DP (°C @ 760mm Hg, max)	220
Purity (wt %, min)	98.0
Acidity (wt %, as acetic acid)	0.02

(Isophorone is a product of Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. Check CP 1095 opposite last page.)

Excellent adhesion to metals advantage of epoxy type casting resin . . .

product is stable over temperature range from −100 to +400°F

Easy-to-use, epoxy-type casting resin has excellent adhesion to metals, plastics, and ceramics. It has a low thermal coefficient of expansion and is stable over a temperature range of −100 to 400°F. Viscosity at room temperature is below 10,000 centipoises, making material easy to pour. Properties of casting resin cured with catalyst are as follows:

Tensile strength, psi	9,000
Compressive strength, psi	16,000
Flexural strength, psi	15,000
Izod impact (ft lb/in of notch)	0.3
Water absorption, % (7 days at 25°C)	0.1
Dielectric constant, to 10^{10}cps	4.4

(Stycast 2651 casting resin is a product of Emerson & Cuming, Inc., Dept. CP, 869 Washington St., Canton, Mass. Check CP 1096 opposite last page.)

Shorten Your Process Time

with

U. F. CONCENTRATE – 85

(59% Formaldehyde – 26% Urea)

If your process needs high concentrations of both formaldehyde and urea use Nitrogen Division's U.F. Concentrate–85 – the highest available concentration of liquid formaldehyde–59% Formaldehyde, 26% Urea. Active content is 85% by weight.

There are many advantages:

- Increase production in shorter time with existing equipment.
- Reduce processing time for dehydration.
- Charge larger batches to kettles.
- Pump U.F. Concentrate–85 using your regular formaldehyde facilities.
- Save storage, handling and shipping costs.

For full information, free folder and samples of U.F.–85, write *today!*

NITROGEN DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

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Allied Chemical

NITROGEN DIVISION ALLIED CHEMICAL

OTHER HIGH PURITY FORMALDEHYDE SOLUTIONS

For a variety of applications

37% Low Methanol
37% Inhibited (6%-7% methanol)
37% Inhibited (10%-12% methanol)
44% Low Methanol
44% Inhibited
45% Low Methanol
50% Low Methanol

Anhydrous Ammonia • Ammonia Liquor
Ammonium Sulfate • Sodium Nitrate
Methanol • Ethanolamines • Ethylene Oxide
Ethylene Glycols • Urea • Formaldehyde
Nitrogen Tetroxide • U.F. Concentrate–85
Fertilizers & Feed Supplements
Nitrogen Solutions

When inquiring check CP 1097 opposite last page

Ten more organic chemicals listed

Ten additional organic chemicals are now in manufacturer's line. These include 4,4'-bis(4-amino-1-naphthylazo) 2,2' - stilbenedisulfonic acid, recommended for "phenolphthalein" alkalinity determination in water testing. This pH indicator shows a pink-to-blue color change at pH of 8.2, and is easier to observe than the phenolphthalein end-point.

Other additions are:

3-Benzoylacrylic acid (Pract.), Mp: 91-94°C. $C_6H_5COCH:CHCOOH$.

Bis(α-methylbenzyl) ether (Pract.). Bp: 146-150°C @ 8 mm. $[C_6H_5CH\text{-}(CH_3)]_2O$.

cis-1,2-Dichloroethylene. Bp: 59-60°C. CHCl:CHCl.

trans-1,2-Dichloroethylene. Bp: 48-50°C. Same formula as above.

1,6-Hexanediamine Dihydrochloride. $NH_2(CH_2)_6NH_2 \cdot 2HCl$.

1,6-Hexanediol. Mp: 40-42°C. $HO(CH_2)_6\text{-}OH$.

N-(2 - Hydroxethyl) - 2 - phenoxyacetamide. Mp: 48-51°C. $C_6H_5OCH_2CONHCH_2CH_2OH$.

Oxybis(2-ethylbenzoate) (Pract.). Bp: 225-227°C @ 3 mm. $C_6H_5COOCH_2CH_2OCH_2 - CH_2OCOC_6H_4$.

1,2,3,4-Tetrabromobutane. Mp: 115 - 118°C. $CH_2BrCHBrCHBrCH_2Br$.

(Organic Chemicals are products of Organic Chemicals Dept., Distillation Products Industries, a Div. of Eastman Kodak, Dept. CP, 343 State St., Rochester 3, N.Y. Check CP 1098 opposite last page.)

Pentaerythritol

Used to make many resins, plasticizers, and processed oils, pentaerythritol is discussed in illustrated 24-page brochure.

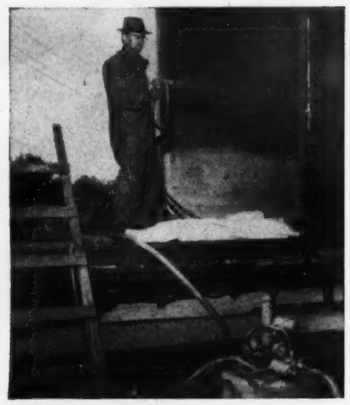
"Economies of PE" is issued by Synthetics Dept., Hercules Powder Co., Dept. CP, 940 Market St., Wilmington 99, Del. Specify CP 1099 opposite last page.

for your information . . .

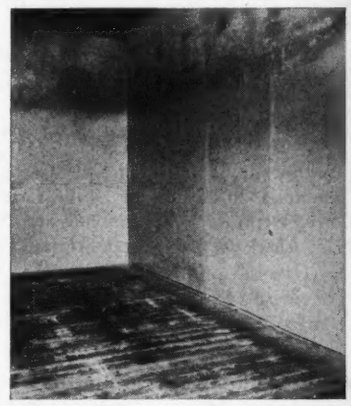
brief summaries of helpful product news

New, fast way to reline boxcars with reinforced plastics suggests many in-plant uses

In only 2 to 3 hours damaged boxcar lining (left) can be restored for many months of extra duty with a tough, protective coating of reinforced plastics.



Polyester resin, sprayed on lining with ordinary spray equipment. While coating is still wet, fiberglas cloth is applied, followed with another coating of resin.



Reinforced plastic coating can be cleaned with detergents, disinfectants, steam: can be applied in wide ranges of weather and temperature extremes.

One of the major contributors to the present boxcar shortage is the car that has lining in such poor condition that it must be torn out and replaced. This costly, time-consuming job can knock a car out of service for as many as 70 to 100 hours.

Relining time cut to only 2 to 3 hours

A new method of lining freight car interiors has been developed by an aggressive midwest manufacturer.† The process, employing two materials—a special polyester resin and a glass reinforcing cloth—has reduced the operation to only 2 to 3 hours, depending on surface to be covered . . . offers a quick solution to the car shortages experienced by most railroads.

How it's done

Complete or partial relining with reinforced plastics is applied as follows:

1. Using ordinary spray equipment, a basic coating of polyester resin is applied.
2. Glass cloth is applied to wet, tacky coating.
3. A second coat of polyester resin is applied over cloth and dries to a hard, rigid smooth finish.

Money, manpower savings

Two men can complete the application in about 2 hours. In experimental applications, maximum costs have averaged $150.00 per car including labor and material . . . a fraction of the cost of ripping out and installing wood lining.

Suggests many in-plant uses

The use of such rugged, reinforced plastic protective coatings is becoming a standard maintenance practice in many plants. Warehouse stall partitions and surfaces requiring resistance to moisture or abrasion activity, for example, are easily and economically surfaced in short order.

For more information on this process, check the coupon to the right and mail to Monsanto today.

Monsanto does not make polyester resins, but it does supply the plastics industry with its basic raw materials: phthalic and maleic anhydrides, fumaric and adipic acids, and styrene monomer.

†*Name on request.*

Pydraul F-9 wins UL listing; 2 new Pydraul grades developed

On May 31, 1955, Pydraul* F-9 became the world's first fire-resistant hydraulic fluid listed by Underwriters' Laboratories. From the Laboratories' Service Card: "The fire hazard of Pydraul is rated 2 to 3 in accordance with Underwriters' Laboratories, Inc.'s Standard of Classification in which ether rates 100, gasoline rates 90-100, alcohol (ethyl) rates 30-40 and paraffin oil rates 10-20."

For lubricity, stability and service life, Pydraul F-9 equals the performance of premium petroleum fluids. The Timken lubricant test shows Pydraul has a film strength of 17,500 psi, while ordinary petroleum-based fluids rate only 5000. The Almen wear tests using Pydraul showed only 2 mg. of metal lost in a 20-minute run. With petroleum oil, metal seized in one minute under the same load. Pydraul F-9 is also re-usable, noncorrosive, stable and economical.

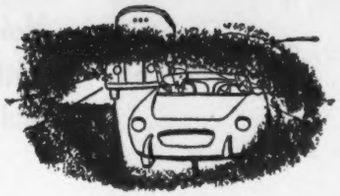
Two new grades of Pydraul are now available:

PYDRAUL 600 is a fire-resistant hydraulic fluid which delivers maximum performance where a high-viscosity fluid is required.

Designed originally for use in die-casting machines and presses, Pydraul 600 has also gained wide acceptance in other applications such as a lubricant for air compressors.

PYDRAUL 150 is designed for use in equipment where a low-viscosity fluid or low-temperature operation is required. Pydraul 150 is commonly used in regulating equipment throughout the steel industry, particularly in out-of-doors installations.

For more information on Pydraul hydraulic fluids, check the coupon.



New Multipurpose Additive Increases Lubricant Efficiency

A true multipurpose additive which sets a new standard of gear lubricant performance has been developed by Monsanto.

Called Santopoid* 44, the additive combines in one product the best performance characteristics of several separate additives which are effective only in limited applications.

Lubricants compounded with Santopoid 44 provide complete passenger car hypoid protection under the most severe road test and laboratory conditions . . . not only in the SAE 90 grade but in the SAE 80 grade as well.

Field experience proves Santopoid 44 also gives better heavy-duty truck and bus gear protection without compromising superior high-speed performance. Heavy equipment is protected even when performing the most severe off-highway service.

For information, please mail coupon.

Versatility of Dibutyl Fumarate described in new technical bulletin

A new technical bulletin is now available on versatile dibutyl fumarate. A reactive resin and chemical intermediate, dibutyl fumarate forms copolymers with various monomers under adjusted reaction conditions to produce polymers ranging from brittle resins to soft; internally plasticized materials.

Copolymers of dibutyl fumarate with vinyl acetate, vinyl chloride, acrylates and styrene are used in formulating surface coatings, free films, permanently tacky adhesives, fibers, synthetic lubricants and additive agents for oils. And as a chemical intermediate, it yields substituted succinates readily with the addition of halogens, aldehydes, thiols and similar compounds.

DIDP-E offers big wire coatings benefits

For maximum retention of elongation, tensile strength and modulus properties in wire coatings, specify Monsanto plasticizer DIDP-E (with 0.1% Bis Phenol A antioxidant added). Tests show the compound's electrical properties are equal or superior to DOP. 60° C. T or TW formulations are now available.

*Reg. U. S. Pat. Off.

MONSANTO CHEMICALS – PLASTICS

WHERE CREATIVE CHEMISTRY WORKS WONDERS FOR YOU

MONSANTO CHEMICAL COMPANY 10/55
810 North 12th Street, St. Louis 1, Mo.

Please send:

- ☐ More information about the special surface coating process using polyester resin and glass cloth.
- ☐ Santopoid 44, Tech. Bul. O-121
- ☐ Pydraul F-9 book
- ☐ Dibutyl fumarate, Tech. Bul. ODB-54-18

In addition, I would like information about.....

.....

Name..... Title.....

Company.....

Street.....

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Diethylene glycol mono laurate

Witco DGL, diethylene glycol mono laurate blended with modifying agents, is used as an emulsifying agent for oil-in-water emulsions. It is also an anti-foaming agent in latex and resin emulsion paint systems. Two-page data bulletin describes applications, gives typical properties.

Bul H-2 is issued by Witco Chemical Co., Dept. CP, 122 E. 42nd St., New York 17, N.Y. When inquiring specify CP 1100 on handy form opposite last page.

UL approves resin for electrical compounds

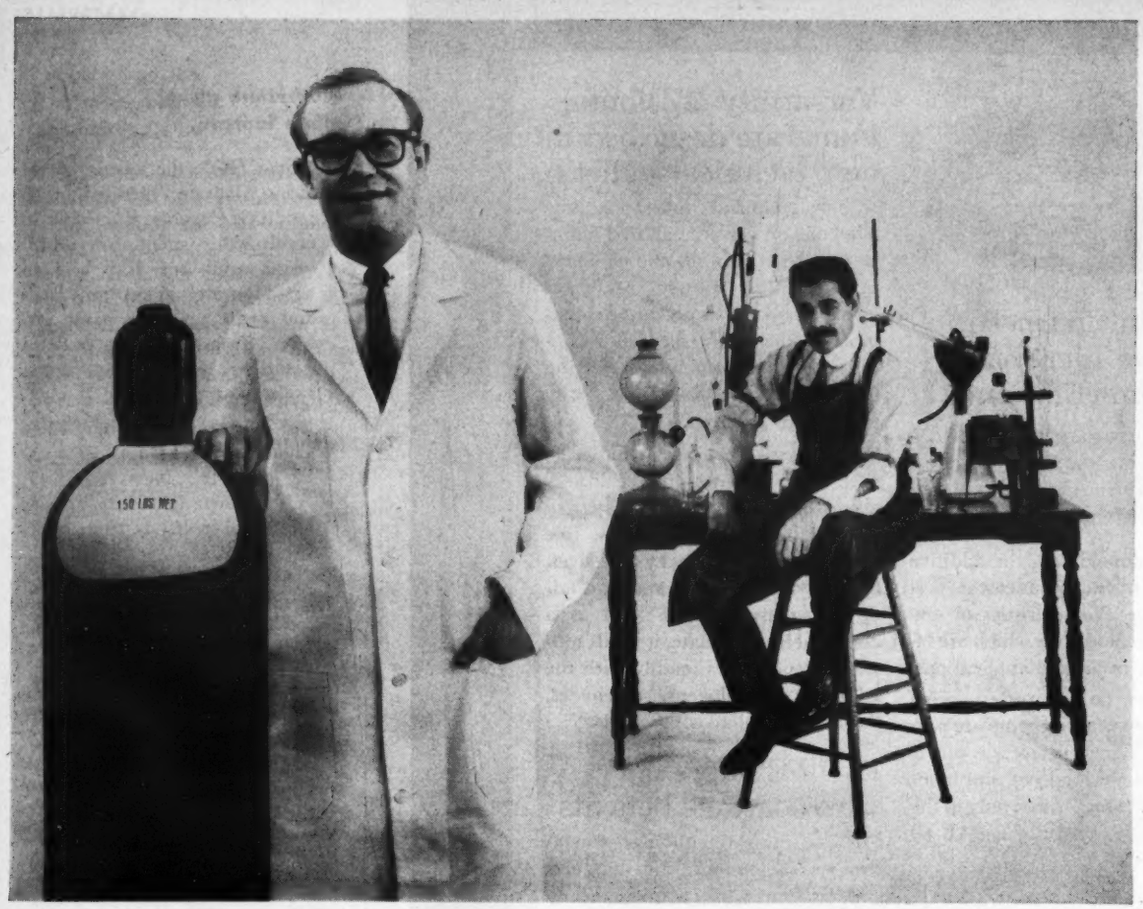
Underwriters' Laboratories has tested and found acceptable manufacturer's PVC-50 resin acceptable as an interchangeable basic resin for use in all UL-listed vinyl electrical compounds.

(PVC-50 resin is a product of Plastics Div., Diamond Alkali Co., Dept. CP, 300 Union Commerce Bldg., Cleveland 14, Ohio . . . or for more information check CP 1101 on handy form opposite last page.)

Tetrazolium salt available

Blue tetrazolium (BT) is available in lab-scale quantities for demonstration of oxidation-reduction enzymes systems, and determination of ketol steroids and reducing sugars, from Dajac Laboratories, Div. of The Borden Co., Dept. CP, 511 Lancaster St., Leominster, Mass. . . . or for more information check CP 1102 on handy form opposite last page.

For more information on product at left, specify CP 1103 . . . see information request blank opposite last page.



We can apply 40 years experience to help solve your Sulfur Dioxide problem

The chemist in the background (above) dates us—August of 1915 to be exact. This was the month and year we shipped our first cylinder of liquid sulfur dioxide.

A good deal of our energies during the past 40 years have been devoted to perfecting a quality-control system for the manufacture of sulfur dioxide. Today, we are supplying our customers a near 100 percent pure grade (99.9%) of this chemical.

Equally important, to our way of thinking (our customers' too), has been the growth of our service facilities. Over the years we have been privileged to serve and instruct a host of industries in the economical application of sulfur dioxide. This background of diversified experience is available for your use.

Special problems involving sulfur dioxide, those relating to new or unusual uses, receive special attention in our research laboratories. So if your chemical process includes bleaching, acidifying, purifying, fumigating, reducing, or preserving, investigate the advantages of using Ansul liquid sulfur dioxide. Write ANSUL CHEMICAL COMPANY, Dept. C-34 Industrial Chemicals Division, Marinette, Wisconsin.

ANSUL

When inquiring check CP 1104 opposite last page

Holds pigments in suspension with minimum of separation and at low viscosities

Modified polyacrylate is water-soluble, becomes water-resistant on drying

Uses: In formulating latex-base paints where it improves flow-out and water resistance, reduces pigment settling, and provides stable viscosities. In preparation of pigment dispersions for leather finishes (both glazed and resin emulsion), pigment grinds give increased tightness or crock resistance. Solution is especially good where flexibility and softness are factors.

Other suggested uses include: textile pigment dyeing as a water-resistant binder, printing inks to reduce smudging, pigment binder in coloring of stucco or concrete, stabilizer and suspending agent in polishes, pigment grinding medium in preparation of specialty papers, as a barrier material in paper laminates, and as a thickener for alcoholic solutions of nylon prepared for coating purposes.

Features: In pigment dispersions, the pigments are held in suspension with minimum separation and yet at low viscosities. Itself water soluble, material becomes water-resistant on drying, and helps maintain or improve water resistance of its formulations.

Upon thorough drying, material deposits a flexible, water-resistant film which does not discolor. It is not otherwise affected by exposure to sunlight and normal aging conditions, and is not in itself subject to bacterial decomposition. Necessity for using wetting agents or protein stabilizers in preparation of pigment dispersion is reduced or eliminated entirely. The compound is completely miscible with and stable to alcohol.

Description: Material is a water solution of a modified ammonium polyacrylate. Straw-colored, and jelly-like in consistency, it has these physicals:

pH	9.5-10.0
Sp gr (@ 25°C)	1.01
Viscosity (cps @ 25°C)	15,000 — 30,000
Solids (%)	6.5 ± 0.5

Dispersions may be prepared by ball mill, colloid mill, or similar grinding techniques. A simple slurry is made by stirring pigment in water, followed by the dispersant in form of a water solution at any convenient concentration. A defoaming agent is added where necessary, followed finally by the polyacrylate solution. This mixture is ground and then brought to its final volume or adjusted to its proper concentration prior to grinding, whichever is more convenient or economical.

A typical dispersion in rubber latex compounding is shown below. It involves zinc oxide, which is a most difficult material to keep dispersed because

of its tendency to pack, and requires drastic measures to redisperse to a usable condition. However, after standing 30 days, a dispersion made to this formula settled only to a small degree, and solids were easily redispersed by mild agitation.

	lb.
ZnO	100.0
Daxad	6.0
KOH (25% soln)	0.8
Ammonia-cut casein (12%)	20.0
Hycryl A-1000	30.8
FM-30 Antifoam	1.8
Butrol preservative*	1.6
Water	138.0
	299.0

*Buckman Laboratories, Memphis, Tenn.

(Hycryl A-1000 modified polyacrylate is a product of Union Bay State Chemical Co., Inc., Dept. CP, 491 Main St., Cambridge 42, Mass. . . . or for more information check CP 1105 on handy form opposite last page.)

Low viscosity of casting wax gives easy injection, no flow line

Casting wax PC-44 has relatively low viscosity, permitting easy injection with no flow line defects. Although wax is ready for use without addition of other components, it can be blended with other waxes to impart its good molding characteristics and to vary injection temp.

Specification of the wax is as follows:

Mp (ring and ball, °F)	165-175
Injection temp (°F)	140-180
Solidification point (°F)	140-145

(Casting wax is a product of Wax Div., Petrolite Corp., Chrysler Bldg., New York 17, N.Y. . . . or for more information about manufacturer's product reader may simply check CP 1106 on handy form opposite last page.)

Use of activated carbon in industrial processes

Selection of grade and type of activated carbon, characteristics of Adsorbite activated carbon, and its application in industry are contained in seven-page mimeographed bulletin. Many activated carbon uses are detailed. These include separation by adsorption, both gas and liquid chromatography, fixed and moving bed operations, batch treatment of liquids.

Bul #11 is issued by Barnebey-Cheney Co., Dept. CP, Cassady at E. 8th Ave., Columbus 19, Ohio. When inquiring specify CP 1107 on handy form opposite last page.

Could this mean a **FORTUNE** to you?

. . . This white powder is ALCOA Alumina—aluminum oxide—a versatile chemical product that has helped to build success for ingenious manufacturers.

ALCOA Alumina presents properties that are indeed stimulating to scientists, researchers and development engineers—properties that open the door to possibilities in numerous fields.

For example, ALCOA Alumina has an extremely high melting point (3,704° F). This property alone has opened up high-temperature applications once thought impossible—super-refractories, insulators for automotive and jet engine spark plugs, and many more.

ALCOA Alumina is a crystalline material with very sharp edges and corners, from which it derives its value as a fast-cutting abrasive. Moreover, it is exceptionally hard (9 on Moh's scale), providing such good abrasion resistance that it is now used where once even strong metals failed—in pipe linings, forming dies, thread guides, grinding mills.

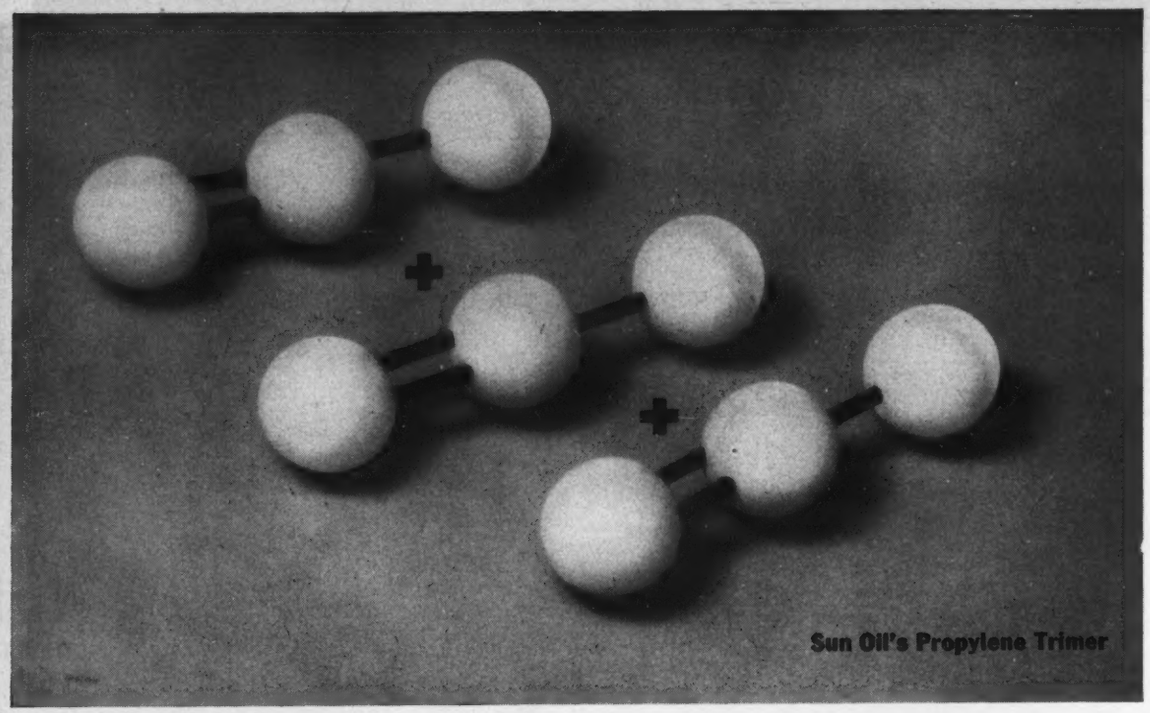
The list of successes could be expanded almost without end. Tooth paste, whiteware, dehydration and catalytic processes, glassware, ceramic tile, bearings, concrete—*all* have been measurably improved by ALCOA Aluminas.

ALCOA Aluminas have a habit of making money for manufacturers. Almost every day someone puts them to work on profitable—often amazing—applications. Why not investigate ALCOA Aluminas? They *could* mean a fortune to you.

For further information and samples to test in your own plant, write to ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 705-K Alcoa Building, Pittsburgh 19, Pa.

ALCOA CHEMICALS
ALUMINUM COMPANY OF AMERICA

When inquiring check CP 1108 opposite last page



YOU GET CONSISTENT UNIFORMITY FROM SUN OIL'S PROPYLENE TRIMER

Consistent uniformity of Sun's propylene trimer eliminates color problems in end products...makes it give particularly excellent results in alkylation reaction with aryl groups in the production of synthetic detergents.

Of special interest to chemists in many other fields is the fact that butylenes are eliminated from Sun's propylene trimer. It is almost entirely mono-olefinic...averaging 99.5%. The distribution of the olefin types in propylene trimer is indicated as follows:

Terminal Olefins:

$R-CH=CH_2$	5%
$\frac{R_1}{R_2}>C=CH_2$	12

Non-terminal Olefins:

$\frac{R_1}{H}>C=C<\frac{H}{R_2}$ (trans)	16
$\frac{R_1}{H}>C=C<\frac{R_2}{H}$ (cis)	5
$\frac{R_1}{R_2}>C=C<\frac{R_3}{H}$	46
Remainder: (Presumably tetra-substituted olefins)	16

For other information, see your Sun representative, or write for Technical Bulletin #20. Address Sun Oil Company, Philadelphia 3, Pa., Dept. CP-10

Typical Specifications

API Gravity @ 60 F	57-61
Specific Gravity	0.7351-0.7507
Distillation, 5%	265 F min
95%	275-305 F
Sulfur, wt, %	0.02 max
Bromine Number	135 min
Color, Saybolt	21 min

SUN OIL IS A MAJOR PRODUCER OF:

Benzene • Toluene • Mixed Xylenes • Propylene Trimer and Tetramer • Sunaptic Acids (High Molecular Weight Naphthenic Acids) • Sulfonate WS (Water Soluble Sulfonate) • PDO-40 (Polymerized Drying Oil)

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY, PHILADELPHIA 3, PA.

IN CANADA: SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

SUNOCO

When inquiring check CP 1109 opposite last page

For making silicone resin-based protective coatings . . .

two 100%-silicone resins have good solubility, are compatible with fillers, pigments

Uses: In formulating silicone resin-based protective coatings.

Features: Resins are soluble in a wide range of solvents and are compatible with many heat-stable fillers and pigments. They are adaptable to formulations requiring uncommon solvents or unusually high solids ratios. Properly applied and cured, films are characterized by unusual heat stability, good dielectric properties, water-repellency, and resistance to weathering and many chemicals.

Description: Silicone resins are identified as Dow Corning R-5061 and R-5071 and come in form of crumbled solids. Films based on R-5061 are tough and have good color retention. Those based on R-5071 are somewhat less flexible and more thermosetting. Intermediate properties may be obtained by blending.

Both resins contain 98-100% solids, are light straw colored, have sp gr of 1.17, and an mp of 230°F, as supplied. Curing time is one hr @ 480°F. Not more than 2% of toluene is present as solvent.

(Silicone resins for coatings are products of Dow Corning Corp., Dept. CP, 592 Saginaw Rd., Midland, Mich. . . . or for more information check CP 1110 on handy form opposite last page.)

Imparts water-penetration resistance to leather, when properly applied . . .

partially-neutralized succinic acid coats fibers, permits leather to "breathe"

Uses: To impart water-penetration resistance to leather products. It may be applied at the tannery or formulated into liquid polishes and daubing solutions for use by consumer.

Features: Material imparts excellent water resistance to leather, while permitting moisture vapor permeability. Leather stays soft and an absorptive inner surface of the shoe can be provided.

Description: Bavon compound may be applied by brush coater, roller coater, spraying, or hand swabbing. All types of shoe upper leathers can be treated. Finished as well as crusted leather can be treated from the flesh or grain side. Chemically, compound is partially-neutralized succinic acid.

(Bavon is a product of Koppers Co., Inc., Dept. CP, Koppers Bldg., Pittsburgh 19, Pa. . . . or for more information check CP 1111 opposite last page.)

Gives fast, easy dispersion and has good flow at high loadings . . .

channel black is specifically designed for inks

Uses: Specifically designed for ink making.

Features: Black gives fast and easy dispersion, and has good flow at high loadings. Its performance in heat set, commercial letterpress and litho inks is outstanding and supplements manufacturer's Arrow ink black.

Description: Aroflo, a long flow channel black, has low oil absorption, low viscosity, and is fast drying. It has a blue, dense undertone.

(Aroflo black is a product of the J. M. Huber Corp., Dept. CP, 100 Park Ave., New York 17, N.Y. . . . or for more information check CP 1112 on handy form opposite last page.)

Combines best qualities of piperonyl butoxide, pyrethrum insecticides

Uses: As an insecticide, especially to protect grain.

Features: The rapid killing power and complete freedom from toxicity of pyrethrum is incorporated with the stabilizing and insect repellent activity of piperonyl butoxide. It contains no kerosene, odorless base oil, nor any other solvent.

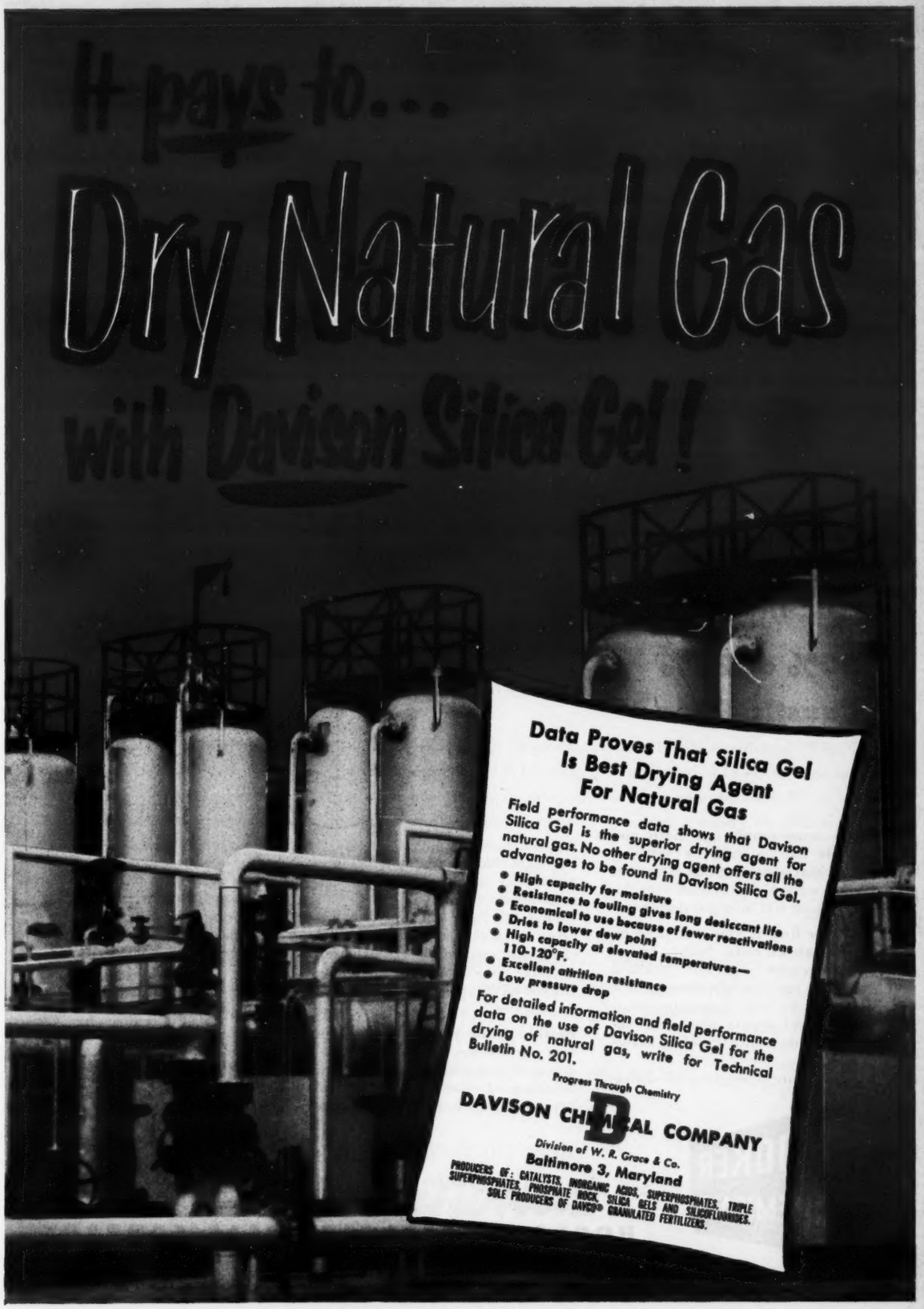
Description: Prentox Pyronyl "75" is an oil-free pyronyl concentrate.

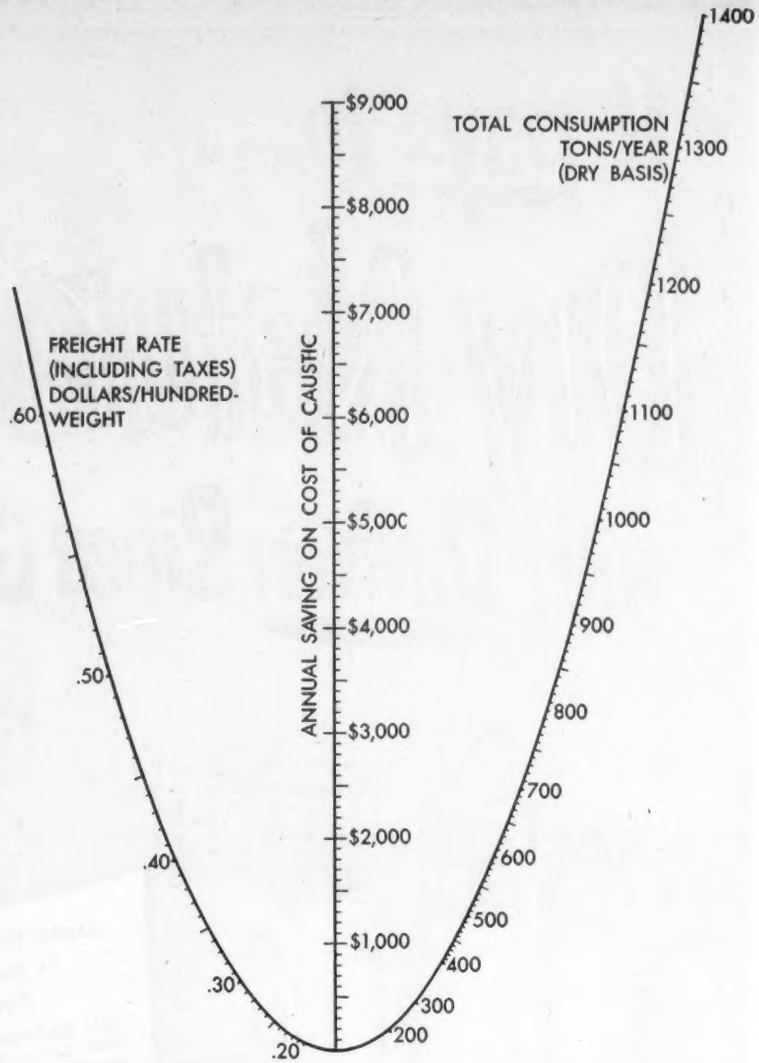
(Insecticide is a product of Prentiss Drug & Chemical Co., Inc., Dept. CP, 110 William St., New York 38, N.Y. . . . or for more information check CP 1113 opposite last page.)

Uses and suggested applications of over 90 castor oil products

Concise descriptions and uses of more than 90 castor oil products and derivatives are covered in 16-page brochure. Applications in such end products as protective coatings, hydraulic fluids, plastics, inks, lubricants, cosmetics, and pharmaceuticals are described. Refined, blown, gelled, hydrogenated, and dehydrated castor oils are cataloged, along with fatty acids, esters, metallic soaps, and specialties.

"Catalog and Product Guide of Castor Oils and Chemical Derivatives" is issued by The Baker Castor Oil Co., Dept. CP, 120 Broadway, New York 5, N.Y. When inquiring specify CP 1114 opposite last page.


It pays to...
Dry Natural Gas
with Davison Silica Gel!
Data Proves That Silica Gel Is Best Drying Agent For Natural Gas
Field performance data shows that Davison Silica Gel is the superior drying agent for natural gas. No other drying agent offers all the advantages to be found in Davison Silica Gel.
• High capacity for moisture
• Resistance to fouling gives long desiccant life
• Economical to use because of fewer reactivations
• Dries to lower dew point
• High capacity at elevated temperatures—110-120°F.
• Excellent attrition resistance
• Low pressure drop
For detailed information and field performance data on the use of Davison Silica Gel for the drying of natural gas, write for Technical Bulletin No. 201.
Progress Through Chemistry
DAVISON CHEMICAL COMPANY
Division of W. R. Grace & Co.
Baltimore 3, Maryland
PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, TRIPLE SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS AND SILICOFLUORIDES. SOLE PRODUCERS OF DAVIS® GRANULATED FERTILIZERS.
When inquiring check CP 1115 opposite last page



Which saves you more...

50% or 73% Caustic Soda?

This nomograph can help you decide Are you using the caustic solution that's least expensive for you? A few seconds' calculation with this nomograph will help you decide.

How to find if you can save on 73% caustic soda Simply draw a line from your freight rate (including taxes) to your annual consumption in tons on a dry basis. Your approximate savings will appear where this line intersects the center line of the nomograph.

This figure represents your savings on freight charges after the $2.00 premium price on 73% caustic soda has been deducted.

From this figure you must deduct a depreciation charge based on the cost of dilution equipment. Your Hooker technical service man is ready to advise you on the equipment needed and its cost.

Double-check your findings this way Before you make a final decision on 50% or 73%, give yourself the advantage of expert technical advice. Let your Hooker technical service man show you what equipment you will need for 73%. He will figure your exact savings—based on a realistic study of your operations.

For quick service, write or phone the nearest Hooker office.

"CAUSTIC SODA BUYER'S GUIDE" is the title of a new pocket-size booklet we'll be glad to send you free. Contains helpful facts on the economics of 50% and 73% solutions; other forms of caustic soda; capacities of tank cars and other containers; useful shipping information. Write us for a copy.

HOOKER CHEMICALS

4-1883

1905—Half a Century of Chemicals
From the Salt of the Earth—1955

HOOKER ELECTROCHEMICAL COMPANY

15 FORTY-SEVENTH ST., NIAGARA FALLS, N. Y.

NIAGARA FALLS • TACOMA • MONTAGUE, MICH. • NEW YORK • CHICAGO • LOS ANGELES

Solutions have sparkling clarity, high degree of compatibility, and high stability . . .

synthetic polysaccharides: adhesive ingredients, extenders, viscosity stabilizers

Uses: As adhesive ingredients in compositions for special paper laminating, straight-line gluing, remoistening and mucilage formulations; as functional extenders for water-soluble gums such as polyvinyl alcohol; as replacements for tapioca dextrine and gum arabic in prepared pastes and for pigment suspension and building applications; and as agents for viscosity stabilization of dextrines and starches.

Features: In solution, compounds have sparkling clarity and high compatibility with other water-soluble products. Outstanding in this respect is complete range of compatibility with the polyvinyl alcohols.

Their stability is demonstrated by the fact that there is no increase in viscosity and no tendency to sludge or become cloudy on storage. Adhesive coatings have very high gloss and good breaking properties.

Description: Polyoses are synthetic polysaccharides, having the same general behavior as high soluble dextrins, vegetable gums of the arabic type, and similar water-soluble adhesives. They come in four viscosity grades. To obtain a Brookfield viscosity of 20-100 poises at 70°F, following aqueous concentrations are recommended:

	% Solids
Polyose A	67
Polyose B	60
Polyose C	50
Polyose D	40

Other properties include:

Moisture (%, max as bagged)	2.0
Packing density (lb/cu ft approx)	23
Color (60% soln, Hellige max)	10
pH (10% soln, min)	3.5
Ash (% dry basis, max)	0.50

Polyoses are white to light tan powders with a slightly sweetish taste. Readily dispersible in cold water, they should be added slowly with agitation.

Addition of strong alkalis is not necessary, unless it is needed to raise the pH of solution. Final pH should be 6 or less. Body and length of solution can be increased by addition of borax — 1-3%, based on Polyose.

Certain acids — such as phosphoric — in 0.1-0.5% amounts, give improved adhesive properties.

(Polyoses are products of Corn Products Sales Co., Dept. CP, 17 Battery Pl., New York 4, N.Y. . . . or for more information about manufacturer's product, reader may simply check CP 1117 on the convenient Reader Service slip which is located opposite last page.)

Principal characteristics of tailor-made paraffin and microcrystalline waxes

Specifications, applications and typical properties of Sunoco paraffin and microcrystalline waxes are presented in 16-page technical bul. Nine standard tailor-made wax periods are described. Sixteen graphs accompany the text and tables. Representative special-purpose wax grades are also covered. Testing and emulsification information are included.

Bul No. 22 "Sunoco Waxes" is issued by Sun Oil Co., Dept. CP, 1608 Walnut St., Philadelphia 3, Pa. When inquiring check CP 1118 on handy form opposite last page.

Modification of styrene polymers gives series of resins which are water-soluble . . .

solutions show no appreciable viscosity changes in a pH range of 1 to 12

Uses: Suggested for use as tackifiers, dispersants, thickeners, and flocculants in many aqueous systems, especially water-based adhesive and paper-coating formulations.

Features: Both resins are water soluble, even in presence of large cation concentrations. Solutions show no appreciable changes in viscosity in a pH range of 1 to 12. They are insoluble in organics.

Description: Lustrex 710 and 770 are derived from styrene polymers of 10,000 and 70,000 mw respectively. They are supplied as the sodium salt, in form of free-flowing powders. Lustrex 710 has higher initial tack. Lustrex 770 may be plasticized with certain polyhydric compounds to produce a satisfactory rewettable adhesive.

(Water-soluble styrene resins are products of Plastics Div., Monsanto Chemical Co., Dept. CP, Springfield, Mass. . . . or for more information check CP 1119 on handy form which is located opposite last page.)

Sodium silicate chemicals

Pocket sized, 20-page booklet presents data on sodium silicate chemicals available from manufacturer. Descriptions, uses are given, tables on comparative sp gr and temperature are included.

"Diamond Silicates" is issued by Silicate Detergent, Calcium Div., Diamond Alkali Co., Dept. CP, 300 Union Commerce Bldg., Cleveland 14, Ohio. When inquiring specify CP 1120 on handy form opposite last page.

COPOLYMERS

that create new properties in vinyl solutions

TYPE OF SOLUTION	Drying Speed	Lack of Odor	Safety of Solvent	Machinability	Compoundability	Mechanical Stability	Ultraviolet Light Stability	Toughness	Adhesion to Polar Surfaces	Water Resistance	Oil and Grease Resistance	Film Clarity	Pigment Binding Power	Adhesion to Difficult Surfaces	Heat Resistance	Low Temperature Flexibility	Tensile Strength
Straight PVAc	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	P	P
PVAc Copolymer with Polar Groups	E	E	E	E	E	E	E			G	G	G	G			P	P
Internally Plasticized PVAc Copolymers	E	E	E	E	E	E	E							G	G		
Internally Plasticized PVAc Copolymers with Polar Groups	E	E	E	E	E	E	E										

KEY: E — EXCELLENT G — GOOD P — POOR

As charted above, the red areas show the advantages of copolymerized vinyl solutions—which further expand on the uses of polyvinyl acetate. For instance:

PVAc Copolymers with Polar Groups can be used in metal primers and metal protective coatings. They also are useful in laminating aluminum foil to many types of commercial materials.

Internally Plasticized PVAc Copolymers can be used to laminate cellulose acetate for decorative purposes and to make other laminations requiring permanent flexibility and adhesion.

Internally Plasticized PVAc Copolymers with Polar Groups retain permanent flexibility in laminating a variety of difficult films, including "Mylar" polyester film, Pliofilm, Kodapak, Vinyl and Saran.

These three basic types of copolymers, as well as straight PVAc solutions, are manufactured by National. The right one may improve your product or process. And if necessary, special properties can often be built-in to meet the particular needs of the job at hand.

National's polymer chemists are always happy to work with you.

RESIN DIVISION
National
STARCH PRODUCTS INC.

270 Madison Avenue, New York 16 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11

When inquiring check CP 1121 opposite last page

Another new development using

B. F. Goodrich Chemical *raw materials*

B. F. Goodrich Chemical Company does not manufacture this cable; we supply only the Geon polyvinyl materials.

Geon takes sting out of salt problem

WHEREVER salt is mined or processed, you have the problem of preventing corrosion. It's toughest where moisture is present, as in the salt conveyor installation above. That's where Geon polyvinyl material enters the picture, as a protective sheathing on the electrical conduit.

The Geon-jacketed conduit is salt-proof, sun-proof, oil-proof, and moisture-proof, resists abrasion, vibration, and extremes of temperature. Aptly named "Sealtite", it is the first flexible, liquid-tight conduit to receive Underwriters' approval.

Geon resins are basic materials throughout the electrical industry, not only for tough exterior jacketing, but for primary insulation as well. Geon contributes high dielectric strength, resistance to aging, and outstanding flex life—can be submerged in water or buried underground for years without degradation of properties.

Geon polyvinyl materials upgrade the physical and electrical characteristics of many products, step up their sales appeal. There's an easy way to learn how Geon can benefit your own operations. Please write Dept. BD-5, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

GEON RESINS • GOOD-RITE PLASTICIZERS . . . the ideal team to make products easier, better and more saleable.

GEON polyvinyl materials • HYCAR American rubber and latex • GOOD-RITE chemicals and plasticizers • HARMON colors

When inquiring check CP 1123 opposite last page

Linear molecular configuration of ethylene homopolymer balances properties . . .

plastic is made by low-pressure catalytic process

Uses: Major areas of application in which product should be of advantage are in films, bottles and containers, housewares, pipe, laminates, fibers, wire and cable insulation, industrial moldings, and structural applications.

Features: Plastic has been proved stronger, tougher, and in some varieties more rigid than conventional polyethylene. It has better resistance to chemicals and to penetration by moisture, gases, and solvents. Brittle point is low.

Typical Properties

Softening temperature (°F, method adapted from that of Karrer, Davis, and Dieterich, I&EC, 2, 96)	260
Sp gr	0.96
Tensile strength (psi, 20 in/min)	
Injection molded	5100
Compression molded	4200
Elongation (%, 20 in/min)	
Injection molded	28
Compression molded	20
Stiffness (psi per ASTM D747-50)	140,000
Melt index (ASTM D1238-52T)	0.6
Impact strength (Izod, ft lb/in notch)	3.0
Brittleness temp (°F)	< -180
Hardness (Shore D)	65
Heat distortion temp (°F @ 66 psi)	165
Flammability (in/min)	1.40
Coefficient of expansion (in/in/°C)	1.33×10^{-4}
Dielectric strength (vpm)	510
Dielectric constant (10^2-10^6 cy)	2.35
Dissipation factor (10^2-10^6 cy)	<0.0005
Gas permeability of film (cc-cm/sec-sq cm-cm of Hg)	
CO_2	0.214×10^{-9}
O_2	0.069×10^{-9}
C_2H_2	0.146×10^{-9}
Natural gas	0.070×10^{-9}
Liquid permeability of film (gm/100 sq in/mil/24 hr)	
Toluene	59.3
n-Heptane	34.8
Ethyl acetate	3.3
Amyl acetate	1.1
Acetone	0.8
Ethanol	0.1

In contrast, the plastic does not soften or deform at steam sterilization temperatures as high as 250°F, such as used in pharmaceutical and hospital procedures.

If specific uses require it, a similar polymer can be tailor-made to provide higher strength, greater toughness, or more flexibility.

Description: Plastic is a true homopolymer of ethylene and has a linear molecular configuration. It has a remarkably good over-all balance of physical properties, permits low-cost fabrication.

The polymer extrudes and molds on conventional equipment, and colors beautifully to a rich finish of high luster. It is produced by company's Marlex process, which company plans to license in near future.

(Marlex 50 ethylene polymer will be available from Adams Terminal Works at Pasadena, Texas, and a plant at Sweeny, Texas, of the Phillips Chemical Co., a sub. of Phillips Petroleum Co., Dept. CP, Bartlesville, Okla. . . . or for more information check CP 1123A on handy form opposite last page.)

Either used alone or blended, rigid polyester resin has thixotropic properties . . .

bodying resin will remain fixed before curing

Uses: As an additive to polyester resins to impart thixotropy. Resin can be used alone where its pecular properties are desirable.

Features: Resin is a thickening agent for polyester resins used in premix compounds, hand lay up operations, or where a degree of thixotropy is desired.

Description: Called IC-480 Thixogel Polyester, resin is a styrene-modified rigid polyester which does not cointain inert mineral pigments. It comes as a thick paste, with the consistency of a heavy grease. Between 10-20% added to IC-312 Standard Polyester will impart decided thixotropic consistency to the resin. Other properties are:

Sp gr	1.12
Weight per gallon (lb)	9.4
Barcol Hardness	45-50

(Thixotropic resin is a product of Finishes Div., Interchemical Corp., Dept. CP, 1754 Dana Ave., Cincinnati 7, Ohio . . . or for more information check CP 1124 on handy form which is located opposite last page.)

Properties and uses of amines

Physical and chemical properties and applications of 25 amines — available in commercial, semi-commercial, or pilot quantities — are presented in 54-page spiral-bound illustrated monograph. Three bibliographies in the book contain 398 entries. Toxicology and safety recommendations are also given. Numerous graphs and tables are included.

"Sharples Amines" is issued on letterhead request to Sharples Chemicals Division, Pennsylvania Salt Manufacturing Co., Dept. CP, 3 Penn Center Plaza, Philadelphia 2, Pa.

Stop...there's a formaldehyde that fits!

The Celanese* Formaldehyde-4 Series offers the right formaldehyde for the job

If a manufacturer's end product is a low solids adhesive, his formaldehyde is Celanese 37% Formalin. But if he makes phenolic resins, formalin means time-consuming dehydration, high storage costs—things he doesn't want. His right formaldehyde is Celanese Para, 91% strength. It cuts his costs, increases his yields, speeds his production to the plastics market.

For textile treating, there's a better form of formaldehyde—Celanese Formcel* Solutions. These water free combinations of formaldehyde and a specified alcohol or glycol can skip two steps in the production cycle. But none of these is direct enough when processing requires formaldehyde gas. This calls for completely anhydrous Celanese Trioxane.

Before you contract for formaldehyde, find out which of the Celanese Formaldehyde-4 fits your exact requirements. Your Celanese representative has challenging cost figures to show you.

Celanese Corporation of America, Chemical Division, Dept. 591-J 180 Madison Avenue, New York 16, N. Y.

*Reg. U. S. Pat. Off.

Celanese CHEMICALS

When inquiring check CP 1125 opposite last page

Try this QUIZ!

Does YOUR Product Need–

Heat Stability ?

Magnesia insures your products against deterioration when incorporated into materials exposed to high temperatures. A dependable thermal stabilizer!

Neutralizing ?

Magnesia is an effective neutralizing agent when used in acid systems requiring pH increase. Economical, too!

Greater Bulk ?

Magnesia provides a means of increasing product volume without materially increasing total weight. Magnesia has an extremely low bulk density; an effective product extender!

General Magnesite offers services in practical applications of magnesia products for improvement of product quality and processing, and for cost reduction.

MAGNESIUM OXIDES • MAGNESIUM CARBONATES • MAGNESITES

General Magnesite & MAGNESIA COMPANY

P. O. Box 671, Norristown, Pennsylvania

When inquiring check CP 1126 opposite last page

Greatly reduced compounding time, increased stability for silicones in extreme-temp service . . .

one gum gives a brittle point below −130°F, is serviceable to +500°F range

Uses: For compounding silicone rubber stocks for low-temp service.

Features: Base-polymers offer greatly reduced compounding time and increase the stability of formulated stocks. They are specifically designed for extreme temperature service.

Gums compound easily and one requires only half the amount of vulcanizing agent needed for standard silicone gums. It also imparts resistance to compression set, without use of toxic additives.

Description: 440 Gum gives silicone rubbers with brittle points below −130°F and which are serviceable at temperatures in range of 500°F. Indications are that dichlorobenzoyl peroxide is a better vulcanizing agent for this gum than is benzoyl peroxide, especially for extrusions. A clear, high mw polysiloxane with phenyl groups incorporated to lower brittle point, 440 Gum is an easy-to-compound polymer.

Also easy to compound is 401 Gum. This gum is a clear, high mw dimethylpolysiloxane. It is a stable and uniform polymer; by speeding compounding, it reduces production time by 25-35%.

Physical properties of cured rubber samples made with both gums are comparable to those of rubber made with manufacturer's 400 Gum. Typical properties of the gums include:

	401	440
Plasticity (Williams, mils)	45	45
Sp gr (@ 25°C)	0.98	0.99
Brittle point, when compounded (°F)	-80	-130

(Silicone gums are products of Dow Corning Corp., Dept. CP, 592 Saginaw Rd., Midland, Mich. . . . or for more information check CP 1127 on handy form opposite last page.)

Gluconic acid and derivatives

A thorough description of gluconic acid and gluconates, along with applications, is given in 12-page, file folder-type technical bulletin. Uses in textile wet processing, metal finishing and cleaning, leather processing, well treatment and secondary oil recovery, algicide compositions, water-base paints, and cement compositions are covered. Nine charts, six tables, and 37 references are given.

Tech Bul No. 33 is issued by Chemical Sales Div., Chas. Pfizer & Co., Inc., Dept. CP, 630 Flushing Ave., Brooklyn 6, N.Y. When inquiring specify CP 1128 on handy form opposite last page.

REDS

more of them... and better made!

58 SHADES AND TYPES

PURE RED IRON OXIDES
- KROMA REDS® (6 Shades)
- "100" SERIES REDS (6 Shades)
- "1000" SERIES REDS (12 Shades)
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RED IRON OXIDES (18 Shades)

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Whenever red is the question, be sure to see your Williams representative. Meanwhile, send today for complete technical information.

WILLIAMS
COLORS & PIGMENTS

C. K. WILLIAMS & CO.
E. ST. LOUIS, ILL. EASTON, PA.
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When inquiring check CP 1129 opposite last page

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One profitable idea can make your trip to this Exposition worthwhile! And you'll learn *hundreds* of new ideas—a wealth of information will be presented under one roof! It's the one way you and your key men can do months of looking and learning in just a few days... and keep up with the important, ever-changing industrial chemistry scene! COMPARE the latest processing methods... SEE the year's biggest display of up-to-date materials and equipment... TALK with technical representatives of over 500 leading manufacturers.

Your Ticket to Philadelphia

YOU'LL save valuable time if you take advantage of this great opportunity to keep up with chemical engineering and chemistry! Fill out and mail the coupon on the other side to be sure of your advance registration and hotel reservations. No obligation, of course.

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"... it is difficult to exaggerate the value of a visit to the Exposition of Chemical Industries. No other agency is so successful in dramatizing to chemists, chemical engineers, production men and executives the advances and latest researches in their fields, so that they may apply, immediately, the newest techniques, equipment and materials to their individual production and research problems. Reduced costs and increased efficiency—these are the true themes of the Exposition of Chemical Industries, whose hundreds of instructive exhibits are ample evidence that these expositions more than fulfill their purpose. A visit to this always-worthwhile exposition is more important than ever in 1955, and is heartily recommended to all who believe in the need for continual progress in a highly competitive economy ..."

—E. R. Weidlein, President
Mellon Institute, Pittsburgh
(Chairman, Advisory Committee,
25th Exposition of Chemical Industries)

COME to the

25th EXPOSITION OF CHEMICAL INDUSTRIES

COMMERCIAL MUSEUM AND CONVENTION HALL
Philadelphia December 5-9

THE Chemical Industries Exposition, with over 500 informative exhibits, is an unequalled opportunity for production men, executives, chemists and chemical engineers to get—first-hand—the latest information about chemicals and raw materials, plant processing machinery, materials of construction, materials handling, control instruments and other automation devices, laboratory apparatus, etc.

This year's Exposition—the 25th—represents over 40 years of progress in America's fastest-growing industry. Because it *is* so hard to keep up-to-the-minute—and because it's so important that you do—be sure to come, and bring your key associates, to the 25TH EXPOSITION OF CHEMICAL INDUSTRIES!

Exposition of Chemical Industries
480 Lexington Avenue, New York 17, N. Y.

Please register me in advance and send admission badge for the 25th Exposition of Chemical Industries.

Name_____

Title_____

Company Name_____

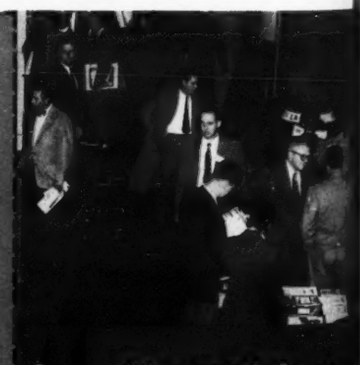
Company Address_____

City_____ Zone____ State_____

Company's Business or Product_____

(For any additional advance registrations desired, just write full information on your letterhead.)

☐ Send me an application for hotel accommodations for the Exposition.

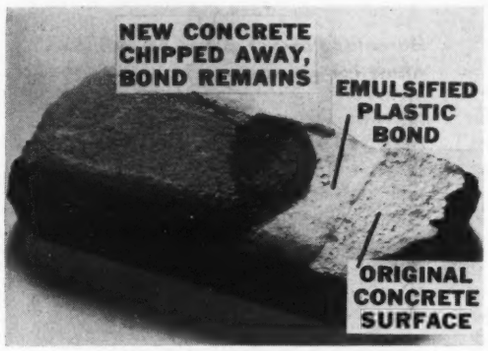


Your Ticket to Philadelphia

Almost indestructible bond made between old and new concrete by synthetic latex . . .

can be applied by brush or spray, dries dust-free in several hours

Emulsified synthetic latex sets up an almost indestructible bond between old concrete, metal and wood surfaces, and any newly applied water-mix surfacing material. Product can be applied by brush or spray. It secures a firm grip and dries dust-free within several hours. Finishing surfacing application may be made at any time up to six days.



Use of bonding material eliminates costly preparation work of chipping, drilling, acid washing, and scarifying to obtain a strong bond. Coverage runs between 80 to 100 square feet per gallon.

(Certified Cretite Bond No. 204 is product of United Laboratories, Inc., Dept. CP, 16801 Euclid Ave., Cleveland 12, Ohio . . . or for more information about manufacturer's product, reader may simply check CP 1130 on the convenient Reader Service slip which is located opposite last page.)

Depicts stabilizing functions of edible colloid

Some of the interesting uses of SeaKem colloids are described in 8-page brochure. These include applications in many pharmaceutical, cosmetic, and industrial products. A picture sequence shows how product is made from the basic source material, Irish moss.

"Colloids Out of the Sea" is issued by Seaplant Chemical Corp., Dept. CP, 63 David St., New Bedford, Mass. When inquiring specify CP 1131 on handy form opposite last page.

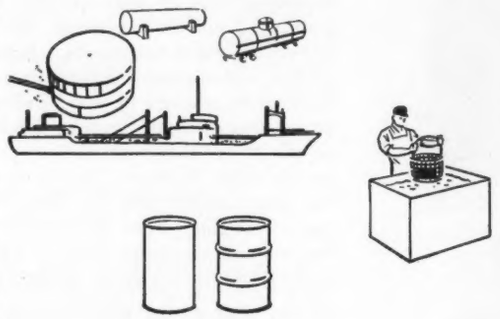
For more information on product at left, specify CP 1132 . . . see information request blank opposite last page.

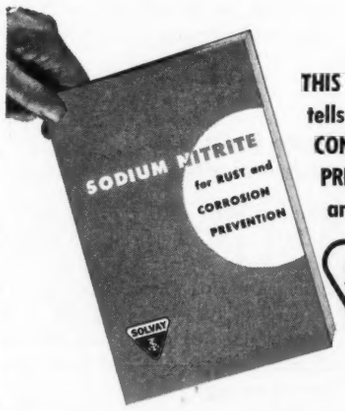
COMBINE

CAUSTIC CLEANING or ALKALINE NEUTRALIZING **with** **CORROSION PROTECTION**

. . . by using

NITROX®





THIS FREE BOOK tells how to CONTROL or PREVENT RUST and CORROSION

SOLVAY

SOLVAY PROCESS DIVISION
ALLIED CHEMICAL & DYE CORPORATION
61 Broadway, New York 6, N. Y.

Allied Chemical

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Monochlorobenzene • Para-dichlorobenzene • Ortho-dichlorobenzene
Snowflake® Crystals • Methylene Chloride • Methyl Chloride
Carbon Tetrachloride

Solvay Nitrox combines the efficient cleaning and neutralizing action of caustic soda with the long-established inhibiting action of sodium nitrite.

Here is a single product that, in one simple operation, will clean iron and steel surfaces . . . or neutralize pickling acids...*and at the same time form a protective coating* to prevent rust and corrosion on the cleaned surfaces.

Nitrox has found wide and varied applications including:

1. **The cleaning and protection of iron and steel drums, tanks or metal parts in process or storage.**
2. **As a combination neutralizing-rust preventing tank dip for metal parts and sheets following pickling.**
3. **As a cleaner-inhibitor for light hydrocarbon cargo tanks in ocean-going tankers.**

Nitrox is easy to use, uniform in composition and positive in action. It is produced in a dustless, flake form and is rapidly soluble in water. It fills a long-standing need for a single product to replace the several individual products and steps previously required.

*In Western Hemisphere Countries.

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SOLVAY PROCESS DIVISION
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Gentlemen: Please send me without cost or obligation*
☐ Your new book "Rust and Corrosion Prevention"
☐ Sample of SOLVAY Nitrox
☐ Specific information requested in attached letter.

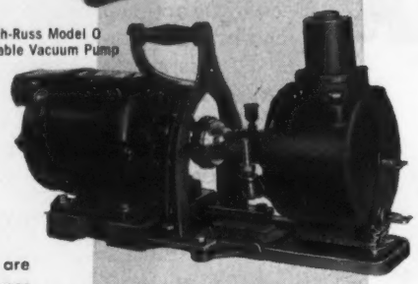
Name_____
Company_____
Title_____
Address_____
City_____ Zone_____ State_____

DS-105

When inquiring check CP 1133 opposite last page

Whatever Your Vacuum Needs... BEACH-RUSS Can Meet Them

Beach-Russ #6
Type RV Vacuum Pump


Beach-Russ Model Q
Portable Vacuum Pump

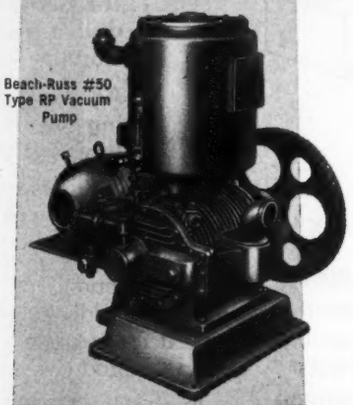
Beach-Russ High Vacuum Pumps are available in a complete range of types and sizes to meet any vacuum need. From the smallest 1 c.f.m. portable unit for testing and dehydrating work, to the large 1800 c.f.m. units for process operations, these precision-built

BEACH-RUSS Vacuum Pumps

give

Fast "Pump-Down"
High Efficiencies
Quiet, Vibrationless Operation
Long Service Life

If you are planning a new installation or are in need of technical advice, get in touch with Beach-Russ.


Beach-Russ #50
Type RP Vacuum
Pump

Mail Today!

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• 50 Church Street • New York 7, N. Y.

☐ We are interested in Beach-Russ Vacuum Pumps for _____

☐ Send _____ copies of General Bulletin No. 89.

NAME _____

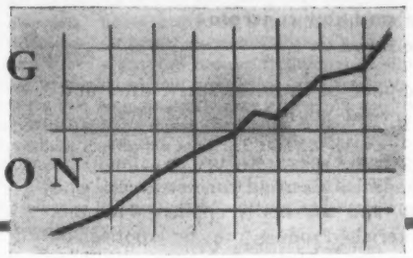
COMPANY _____

ADDRESS _____

CITY _____ ZONE No. _____ STATE _____

When inquiring check CP 1134 opposite last page

EXPANDING CHEMICAL PRODUCTION



Liquid urea and resins plant for Wisconsin

September first is the opening date for Borden's liquid resin plant in Browntown, Wisconsin. Plant will produce liquid urea, phenol, and resorcinol formaldehyde resins. With chief markets in wood industry and paper (wet-strength resins), Borden will supply more than one-million pounds a month to the Midwest. Also to be made at the plant: liquid and dry catalysts, label pastes, cements, other chemical specialties. Borden will warehouse other company adhesives and chemicals at Browntown.

In the heart of the milk country, Browntown is also near many major wood, furniture, and paper plants. Deliveries of chemicals will be by rail and by Borden's own tank truck service.

Becco boost H_2O_2 at two plants

Multi-million dollar expansions at both Buffalo and Vancouver, Washington, are to be made by Becco Chemical Div., Food Machinery and Chemical Corp. Vancouver works will be enlarged about 50% in hydrogen peroxide production. Contracts have already been signed and production is expected by early 1956.

Look for huge expansion in urethanes

Expecting a huge increase (250 times) in production of urethane plastics, Nopco Chemical is starting a $1-million expansion program in the field. Nopco also looks for an upsurge in vinyl foams as "companion products" to urethane.

Hercules Powder plans $6-million plant for pentaerythritol

Hercules Powder is starting a $6-million plant at Louisiana, Mo., for production of pentaerythritol. The new installation will turn out approximately 24-million lb of PE annually. It will also produce about 100-million lb of formaldehyde per year.

Continuous production process for polyvinyl alcohol

Shawinigan Resins Corporation is building a million-dollar plant for production of polyvinyl alcohol. Process used will be continuous, developed by Shawinigan Chemicals of Canada, parent company. Plant will be completed during the latter part of 1956 and will have a multi-million lb capacity.

Another liquid alum plant for West Coast

Stauffer Chemical Company is constructing a liquid aluminum sulfate plant at Tacoma, Wash. Product will be used by pulp and paper industry in Puget Sound area. This will be Stauffer's third western alum plant and it will be completed in October, 1955.

Hike phosphate production in the West

Western Phosphate has developed plans for an expansion of its multi-million dollar Garfield, Utah, plant. Boost will begin to take effect early next year.

News about chemical materials in the US –
plant construction, increased production . . on stream now or planned for future

To build urea plant west of Rockies

Shell Chemical has announced that it will build a urea plant — the first located west of the Rocky Mountains — at Ventura, Calif. Construction will start shortly, with completion tagged for September of 1956. Plant capacity is slated for 100 tons a day. Raw materials — ammonia and carbon dioxide — will be furnished by an adjoining Shell ammonia plant. Montecatini process is to be used under license, M. W. Kellogg contracting.

Polyvinyl in New England

Thompson Chemical is planning to build a PVC plant at North Dighton, Mass. Main plant of Thompson is at Pawtucket where plasticizers and other plastic-industry products are made. Plant will employ the "suspension process" of Scientific Design Co. of New York. Versatility of "suspension" process is reported to be much greater than that of the emulsion process.

Major silicone plant nearly complete

Production will be started early this fall at Linde Air Products Company's $14,000,000 plant for silicones. Linde is a division of Union Carbide and Carbon Corporation. Plant is located at Long Reach, W. Va.

Linde silicones are used for electrical insulation, mechanical rubber parts, mold release agents, damping and hydraulic fluids, defoaming agents, molding compounds and bonding agents. Linde has been engaged in research and development on silicones since the late 1930's. Its present plant at Tonawanda, N.Y., has been in production since 1945.

Dow's glycerine plant to start up

Dow Chemical Company's synthetic glycerine plant at Velasco, Texas, is nearly complete and will be in operation by early fall. Rated capacity will be 36,000,000 lb/yr. Construction was begun approximately a year ago. Plant will be world's second commercial unit.

Lets $21 million contract for rayon plant

American Enka Corporation awarded a $21,000,000 contract for a rayon staple fiber plant at Lowland, Tenn. Construction started in mid-September.

Copolymer plant expanded by 15 per cent

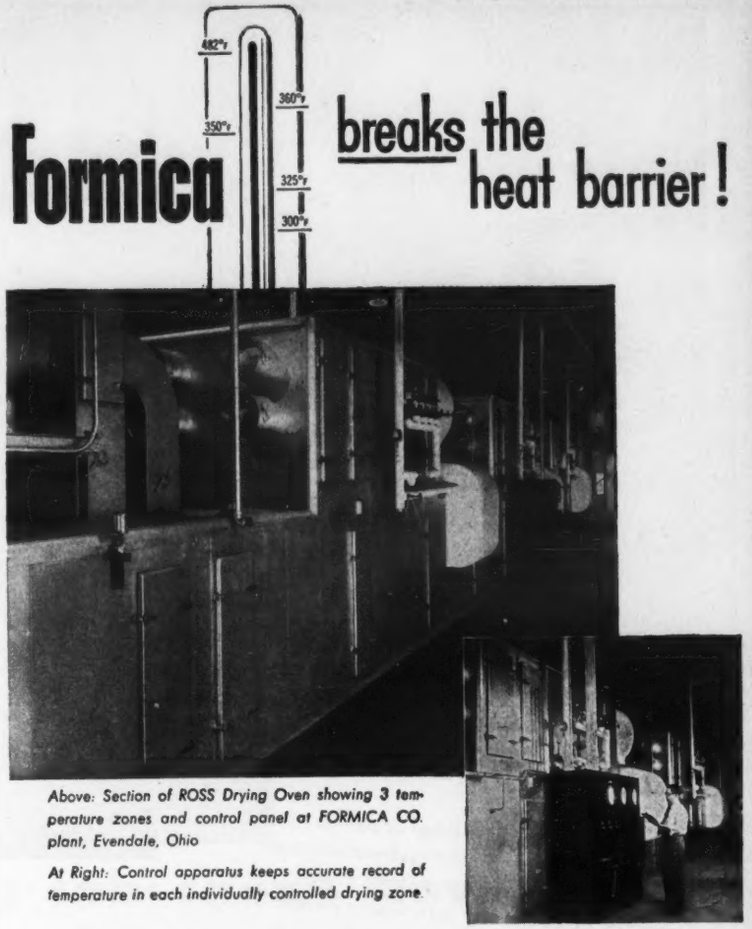
Phillips Chemical Company, subsidiary of Phillips Petroleum Company, is expanding Borger, Texas, copolymer plant by 15 per cent. Construction is expected to be completed by September, 1956. The copolymer and adjacent butadiene plants were purchased by Phillips from the Government in April 1955.

Three-year-old plant boosts capacity

Texas Eastman must expand its new Longview, Texas, plant, which is less than three years old, to meet demand for butyl and derivatives. Most of the demand is coming from users in the plastic field. Texas Eastman Company is a division of Eastman Kodak Company.

(Continued on next page)

Formica breaks the heat barrier!



Above: Section of ROSS Drying Oven showing 3 temperature zones and control panel at FORMICA CO. plant, Evendale, Ohio

At Right: Control apparatus keeps accurate record of temperature in each individually controlled drying zone.

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ROSS DRYING Systems

New grades of FORMICA are now being produced to function perfectly up to 482° F. when required. FORMICA'S advanced research and engineering coupled with the advanced design and construction of its ROSS Treating and Drying equipment have been responsible for this FORMICA achievement.

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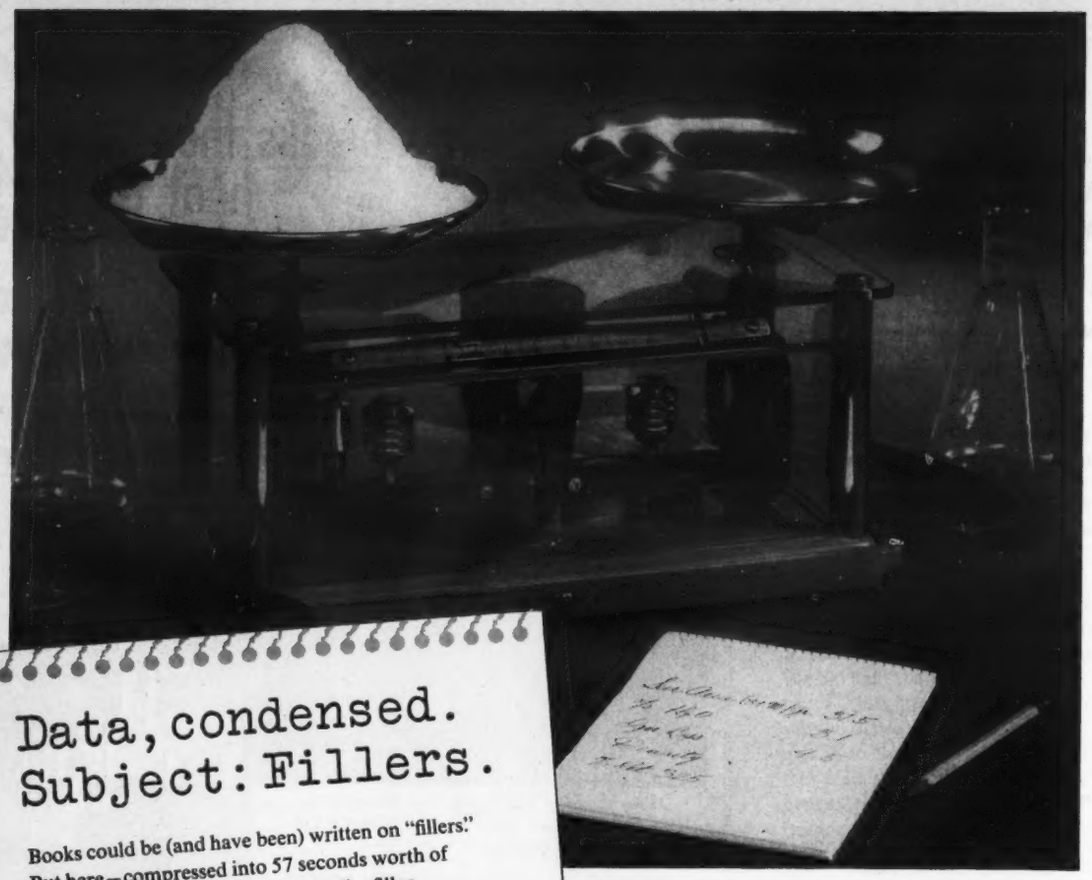

Data, condensed. Subject: Fillers.

Books could be (and have been) written on "fillers." But here—compressed into 57 seconds worth of time—are the salient points of Dicalite filler materials, quick and easy to review for possible application in your own projects.

Dicalite fillers are processed from diatomite into uniform, finely divided amorphous powders, practically pure SiO_2.

MELTING POINT. 2900°F, approx.
MOISTURE. From 0.1 to 6%, depending on grade.
IGNITION LOSS. 0.1 to 5%, approx.
PARTICLE SIZE. Grades varying in fineness up to trace retained on 325 mesh screen. Coarser available.
POROSITY. 70 to 95%.
SURFACE AREA. 7,000 to 150,000 sq. ft./lb.
DENSITY. 7 to 13 lb./cu. ft., loose weight. Apparent specific gravity, 0.112 to 0.21; actual specific gravity, 2.00 to 2.35.
ABSORPTIVENESS. 120 to 300% of weight of Dicalite.
WETABILITY. Excellent.
INERTNESS. Essentially inert in aqueous and acid solutions.

Dicalite fillers supply bulk without significant weight increase and give added strength and toughness. They also improve flexibility, reduce brittleness, decrease heat conductivity, and improve abrasion resistance. In certain products, appropriate Dicalite materials provide excellent mild polishing qualities.

We will be glad to advise on the most suitable Dicalite grade for your purpose, or to work with you in developing a custom-made filler for your particular needs. Write us.

Dependable GLC GREAT LAKES Dicalite® DIATOMACEOUS MATERIALS

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When inquiring check CP 1136 opposite last page

EXPANDING CHEMICAL PRODUCTION

(*Continued from preceding page*)

Pitt-Consol enters chemicals with cresylic acid

Pittsburgh Consolidated Coal Company has purchased the Newark plant of Reilly Tar & Chemical Company and is establishing a modern cresylic acid plant. A new subsidiary, Pitt-Consol Chemical Company, will operate the refinery. Construction of new facilities and renovation of other units has already been started. Approximately 3½ million dollars will have been invested by Pitt-Consol upon completion of present construction plans. Products of the plant will include high-purity cresols, cresylic acids, phenol, resins and molding powders. Facilities will be completed and in operation by mid-1956 but a portion of the old plant will be operated meanwhile to produce present grades of cresylic acids, resins and molding powders.

Wisconsin Steel is building 52 by-product coke ovens

Wisconsin Steel Works, division of International Harvester Company, has begun construction of 52 by-product coke ovens in South Chicago, Illinois. The new ovens will have a rated capacity of 795 tons/day or about 290,000 tons/yr.

Goodyear rubber capacity to be increased

Goodyear Tire & Rubber Company is forecasting that growing world demand for raw rubber will shortly approach present limits of existing rubber plantations and synthetic plants. Capacity of the Houston, Texas, synthetic plant is therefore being enlarged by fifty per cent. Annual production rate is being increased to over 200,000 tons.

Capacity is being increased in two steps. First stage will cost slightly under six million dollars and will boost capacity to 170,000 tons annually. This part of the expansion program will be completed by early 1957 when additional demand is expected to materialize. Underground facilities and other construction work necessary for the second expansion will be completed at the same time.

Anhydrous ammonia plant for Provo, Utah

U.S. Steel's Columbia-Geneva Steel Division has completed preliminary engineering for the anhydrous ammonia plant to be located at Geneva Works, Provo, Utah. Heavy construction is underway.

Project will include a 200 ton/day anhydrous ammonia plant, a nitric acid plant, and a fertilizer-grade ammonium nitrate plant. Ammonia will be oxidized to nitric acid and reacted to form ammonium nitrate. Installation will use raw coke oven gas as the source of hydrogen.

Hooker increases operations at Montague, Mich.

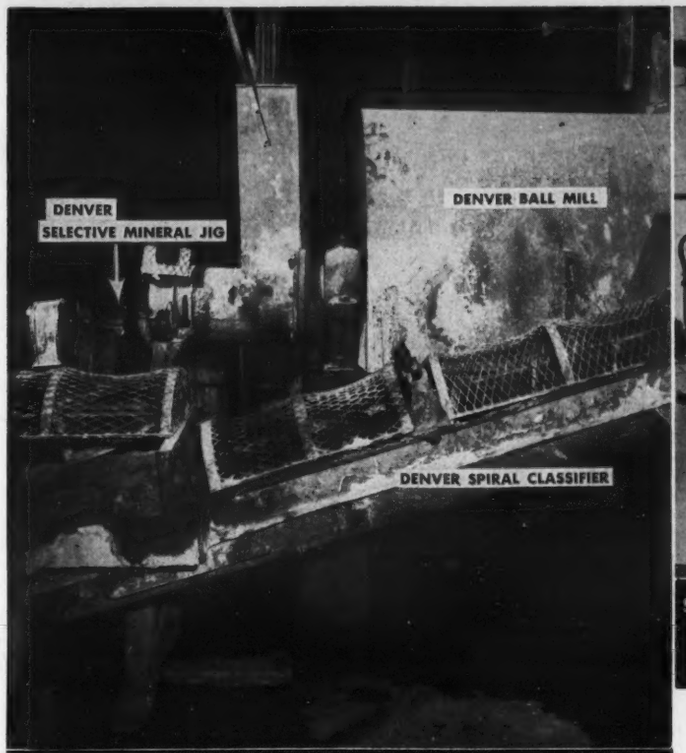
Hooker Electrochemical Company is spending almost three million dollars at Montague, Mich., to diversify and expand operations. Extra facilities to be built over the next year include a hydrogen chloride compression unit and a hydrogen chloride gas pipeline to adjacent DuPont property. Pipeline will deliver one of the two major raw materials used by DuPont in production of neoprene. Units are to be completed by fall of 1956 in time for the start-up of the DuPont plant.

Synthetic "tree rubber" into pilot plant

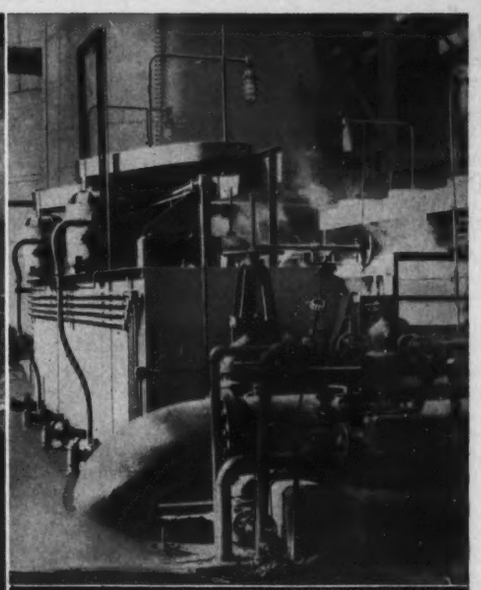
Goodrich-Gulf Chemicals, Inc., is building a pilot plant in northern Ohio to manufacture its "tree rubber." Plant is expected to be in operation in nine months or a year. The rubber is "chemically, and physically, a reproduction of tree rubber." Material will not be in direct competition with other synthetic rubber but with the tree-grown product.

Another "captive" PVC plant for completion in 1956

"Suspension process" will be used by the Eleonora Chemical Corporation, new subsidiary of The Pantasote Company, in polyvinyl chloride plant to be located in Passaic, N.J. Plant is scheduled for completion in 1956. Entire output will be consumed by Pantasote,



$3,000,000 Recovered Annually A Denver Reclamation System helps recover $3,000,000 in silver from waste photographic film and paper in the world's largest photochemical plant. Similar Denver Reclamation Systems in other industries recover platinum from refractory slag, aluminum, magnesium, zinc and manganese from slag, low ash coal from stream bottoms, and de-ink waste paper for re-use.



$64,000 Net Profit in 4 Months A large steel corporation recovers naphthalene from the cooling water in their coke plant with a Denver Reclamation System. Recovery of the by-product naphthalene is 100%. Sale of the by-product naphthalene produced a net profit of $64,000 in the first four months' operation.

DECO testing lab shows how profits can be recovered from industrial waste

If you have a valuable product in your industrial waste, find out how Deco can help you recover it at a profit. These case histories are a few examples of how company engineers have worked with the Denver Equipment Company to perfect reclamation systems. These systems have made profits for their owners.

Your engineers are welcomed in our laboratories. We have complete batch test and pilot plant facilities.

There is no obligation to you for a preliminary analysis and recommendation. Write today for details on how to send your samples.

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$43,000 Saved Each Year A Denver Reclamation System is reclaiming formerly discarded molding sand, and saving a large foundry this amount each year. Deco test investigations often can take an operator's or plant engineer's idea and develop a system producing a new profit — giving his plant a new competitive advantage in a profit-tight industry.

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- ☐ Please send me complete information and bulletins on making Deco Laboratory Tests.

☐ Crushing ☐ Grinding ☐ Classification ☐ Flotation and Gravity Concentration ☐ Leaching ☐ Separation ☐ Waste Reclamation ☐ Sampling ☐ Filtering ☐ Settling ☐ Thickening ☐ Drying and Water Reclamation ☐ Anti-Polution Investigations

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DEPT C-1

When inquiring check CP 1138 opposite last page

ideas — from other industries and the AEC . . . new trends in research, processes, services

Sheet of fine nickel mesh, 500 lines per inch with an open area of approximately 62%

Photoengraving techniques produce metal screens that call for . . .

a new definition for "*fine mesh*"

1000 mesh screens, 50 per cent open area are typical examples of a whole new idea in screen making — some uses are known, possibilities for others are turning up wholesale

Industrial photography has always depended on the products of chemistry. This dependence may become mutual with the development of fine mesh screens, a product of photoengraving techniques. To the casual eye a fine mesh screen might be mistaken for cellophane. It doesn't possess cellophane's transparency, but it does have the same weight, feel and gloss.

Under the microscope all this similarity vanishes. What appears to be a fairly solid sheet turns out to be a precise network of sharply defined metal filament. This network can range up to a total of one million holes per square inch.

These screens have their greatest use in the electronics industry and in particular, computers at present, but the feeling is that their unique properties will fit them for many jobs in the chemical processing field.

(One company is now using them for particle sizing, another for filtering purposes.) First step in making these screens is producing an engine ruling at actual size or larger on a silver coated surface. This is photographed and reduced if necessary to the exact size of the finished screen. The mesh pattern is applied to a photo-sensitive metal plate. After developing, the remaining lines are used as a resist in electroforming the desired metal onto the plate.

One of the remarkable things about these screens is the amount of open area which they provide. With a 100 mesh screen there is 90 per cent open area in thicknesses of .0002 inches; with 500 mesh, 65 per cent open area with thicknesses of .0001 inches; in the 1000 mesh up to 50 per cent open area with thicknesses of .0001. Tolerances of electroformed screens may be held very close, and on the order of 2%. For example, a common size of screen used in electron tubes has a wire tolerance of .0002". These screens can be produced from copper and nickel, or laminations of nickel and copper. Some work has been done successfully with lead. Various plated surfaces may be applied and in addition, the mesh can be successfully electro-bonded to supporting frames and rings. The size of openings in a given mesh may be reduced by continuing the forming process until the openings are on the order of a few microns. These screens have a particular application for precision filtering and may be corrugated to provide a maximum of surface area in a small space.

Although they look fragile, the screens are remarkably tough. For instance, a 500 mesh screen can be stretched across an embroidery hoop and support a ball bearing without sagging. Also, the nickel screens hold up well under heat, being able to withstand hydrogen firing up to 900°F. At present such screens are made in relatively small sizes, the 1000 mesh screen being made in four inch squares and the 500 mesh in eight inch squares. However, larger sizes can be made if a particular process warrants it.

(Fine mesh screens are a product of Buckbee Mears Company, Dept. CP, Lindeke Building, St. Paul 1, Minnesota . . . or for more information check CP 1139 on handy form opposite last page.)

This month's Processing and Engineering
Data section starts on page 248

LOUISVILLE DRYERS are fitted to your job for faster, more efficient performance—lower cost in the long run!

PRE-TESTING IN PILOT-PLANT OPERATION TO ASSURE PERFORMANCE

LOUISVILLE METHOD

1. Initial survey and analysis of your particular problems.
2. Pre-testing in pilot-plant operation to assure performance.
3. Accurate design to meet your specific needs.
4. Top-quality fabrication in General American's own shops.
5. Follow-up checks after installation to guarantee mechanical perfection and efficiency.

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have proved their efficiency and versatility in countless applications. For example:

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625,000 lb
sodium bromide crystallization solution

250,000 lb
molasses, vat dye solution, trioxide pickling solution, tall oil

125,000 lb
phenolformaldehyde, urea formaldehyde, asphalt, starch sizing

62,500 lb
soft drinks, 70% caustic liquor, black liquor, sulfuric acid pickling bath

And remember—both Dow Corning Antifoam AF Emulsion and Antifoam A are physiologically harmless. Both increase production, reduce processing time, eliminate the waste and fire hazard of boil-overs.

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New booklet gives complete information on Dow Corning Antifoam agents, the most efficient and versatile defoamers ever developed. Request your copy on coupon below.

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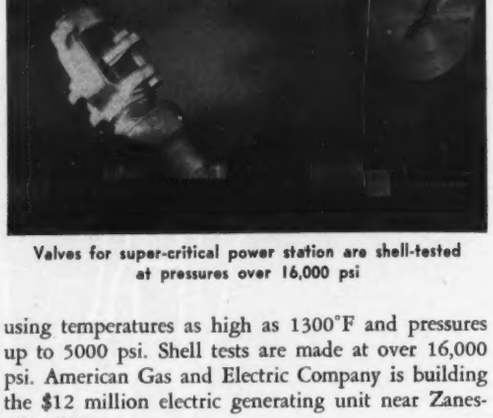
When inquiring check CP 1141 opposite last page

Valves rated for 10,800 psi at room temperature . . .

developed especially for use in first super-critical power station

Plans for the first super-critical power station in the US has led to the development of valves rated for 7250 psi at 700°F, or 10,800 psi at room temperature. Valve tests are conducted in steam super-heater loops



Valves for super-critical power station are shell-tested at pressures over 16,000 psi

using temperatures as high as 1300°F and pressures up to 5000 psi. Shell tests are made at over 16,000 psi. American Gas and Electric Company is building the $12 million electric generating unit near Zanesville, Ohio.

By using steam pressure of 4500 psi and temperature of 1150°F from the boiler (being built by Babcock and Wilcox Company), the unit will cross the "critical pressure" barrier and achieve greater efficiency than is now possible in conventional power plants.

(Valves were developed by Edward Valves, Inc., subsidiary of Rockwell Manufacturing Company, Dept. CP, 1200 W. 145th Street, East Chicago, Indiana . . . or for more information reader may simply check CP 1142 on the convenient Reader Service slip which is located opposite last page.)

Nuclear energy department formed by research organization

Officials of National Research Corporation have announced the formation of a Nuclear Energy Department. On a consulting basis the department will offer engineering assistance in process design, engineering, and business studies for companies considering entry into the atomic energy field. Company also offers research and production facilities for high-purity metals and alloys for nuclear power and propulsion reactors.

(Information courtesy of National Research Corporation, Dept. CP, Seventy Memorial Drive, Cambridge 42, Massachusetts.)

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Hexteel and Floorsteel are carbon or stainless steel armors and retainers for castable refractory monolithic linings. They prolong the life of an installation by retarding abrasive and corrosive action! Our engineering department is prepared to design your total lining requirements. Speedy delivery guaranteed!

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When inquiring check CP 1143 opposite last page

LAB REPORT

Odor and Color Development in ALKYL ARYLS

Problem:
Prevent odor and color reversion during aging of dried alkyl aryls.

Solution:
Protection against odor and color degradation is achieved by the addition of Compound 19 in percentages as low as 0.03%; add Compound 19 to neutralized slurry.

Note: The compound is compatible with additives such as perfumes and sequestering agents.

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Microscopic airborne particles measured, counted at rate of 100 per second . . .

"aerosoloscope" gets results 1000 times faster than conventional methods

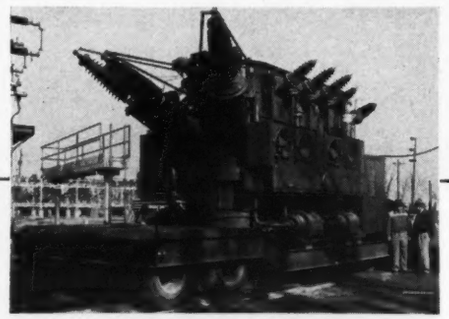
Thanks to an "aerosoloscope", microscopic airborne particles — ranging from radioactive particles to germs — can be measured and counted 1000 times faster than by conventional methods. Developed for the Army Chemical Corps, the electronic instrument can check 1 to 64-micron particles at 100/sec.

Basic principle of operation is scattering action caused by particles on light (observed when viewing microscopic particles in a beam of light). Since larger particles scatter more light than smaller ones, the instrument can readily detect difference. A photomultiplier tube in device measures light being scattered and creates corresponding electrical impulses.

Impulses are transmitted to a set of 12 dials. First dial records number of particles 1 to 1.4 microns in diameter. Each succeeding dial records slightly larger particles than preceding one.

Instrument should find use in industrial air pollution control.

(Aerosoloscope was developed by Armour Research Foundation, Illinois Institute of Technology, Dept. CP, 35 West 33rd Street, Chicago 16, Illinois.)



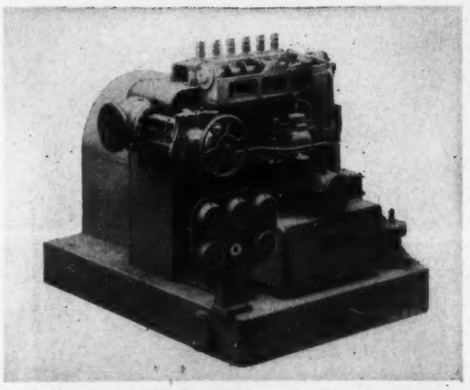
25,000-kva mobile transformer

Believed to be largest mobile transformer ever built, 25,000-kva unit is forced-oil label, forced-air cooled, and has four windings for connection to 138,000, 37,000, and 14,000-volt circuits. Any combination of the voltage ratings may be used. Mounted on a 16-wheel carry-all trailer, transformer measures 11'8" wide x 15' high. Unit will be used as replacement in emergencies and for routine maintenance work by Louisville Gas and Electric Company.

(Mobile transformer was built by Power Transformer Department, General Electric Company, Dept. CP, Pittsfield, Mass.)

NIGHT VIEW of Cities Service Refinery, Lake Charles, La.

Worthington steam turbines keep refineries on stream



WORTHINGTON TYPE S MULTI-STAGE STEAM TURBINE provides drive for generators, pumps, compressors where dependability, close speed regulation, and economy are essential.

Dependable prime movers are a must where breakdowns can run into thousands of dollars a day. That's one reason Worthington steam turbines are the first choice for driving blowers and compressors throughout the petrochemical industry.

But that's only *one* reason for a Worthington steam turbine drive. Take our Type S multi-stage steam turbine. It also gives you:

1. **Close speed regulation** — almost any constant speed or droop characteristic desired. A fact worth noting: Worthington is the only manufacturer offering as standard equipment the Woodward direct-acting governor, Woodward Oil Relay governor, Constant or Variable Speed Oil Relay governor or a mechanical shaft governor to best suit your conditions of service and for maximum economy.
2. **Remote control.** The Woodward Governor with pneumatic or hydraulic head allows remote control using air or other medium.
3. **Steam economy.** Every Worthington multi-stage turbine is designed to fit your specific service with lowest steam consumption.
4. **Low upkeep.** Sound design, accessibility of parts, perfect lubrication, assure continuous service with minimum maintenance.

Find out more about the Worthington steam turbines for your chemical or petrochemical applications. Write Worthington Corporation, Steam Turbine Division, Section T.5.4, Wellsville, N.Y. T.5.4

WORTHINGTON

STEAM TURBINES

When inquiring check CP 1145 opposite last page

Possum Point power plant— first use of canned motor-pump in industry

Unit developed for atomic submarine, provides zero leakage at elevated conditions

Installation of a "canned motor-pump" at Virginia Electric Power Company, Possum Point, Va., marks the first industrial application of this unit which was originally developed for the atomic submarine, Nautilus. Motor-pump has provided continuous, trouble-free service since it was placed in operation in March 1955 at the utility's generating station. This

Canned motor-pump (center) in operation at Virginia Electric Power Company

use suggests other applications in the chemical field where these units may be of advantage at high pressures and elevated temperatures where zero leakage is required.

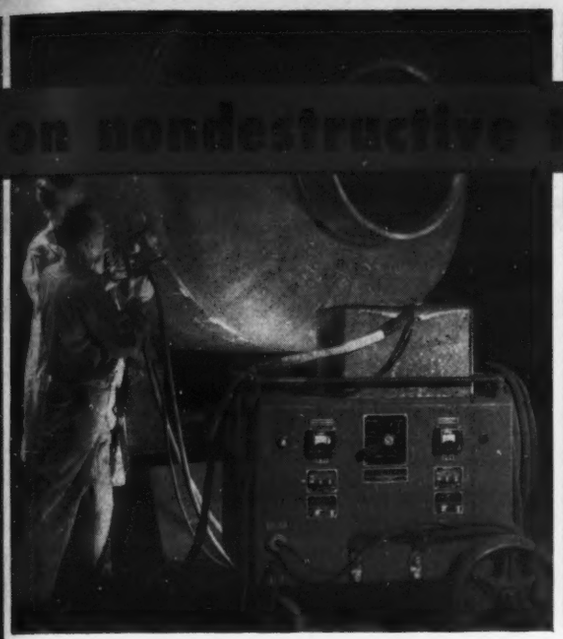
At Virginia Electric Power, motor-pump continuously circulates 4700 gpm of 605° water at 1725 psi, taking suction from the steam drum and pumping through the boiler back to the drum. It is driven at a constant speed of 1800 rpm by a 150 hp, 440 v, 3 phase, 60 cycle motor.

Pump impeller and its electric drive are totally enclosed within a single pressure-tight vessel — hence the term "canned." This assures zero leakage. Rotor is also canned in a similar manner. All parts in contact with the circulated fluid are made of corrosion-resistant alloys — nickel alloyed with steel. There are no external shaft seals. Suction and discharge nozzles are welded into pipe that forms closed-loop system.

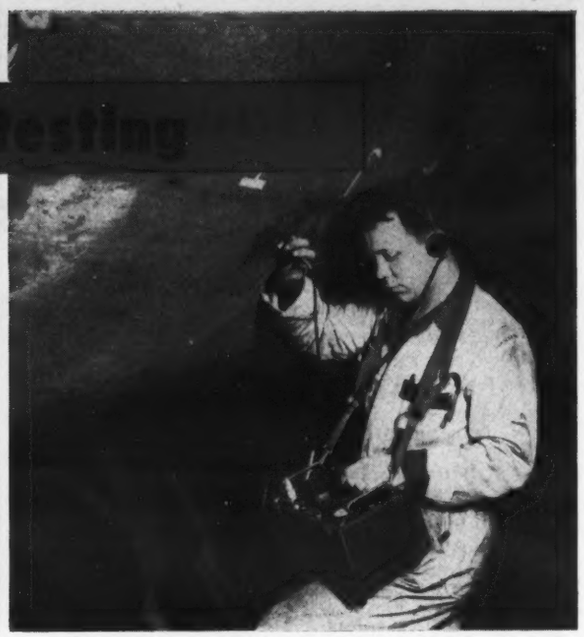
A. O. Smith reports

Important applications for nondestructive tests are those that determine acceptability of materials for specific corrosion-resistant or welding characteristics. Sulphur printing, illustrated here, is one of the control inspections used by A. O. Smith. The test is designed to determine the amount and segregation of sulphur present in forgings. This inspection evaluates the forging for welding.

on nondestructive testing

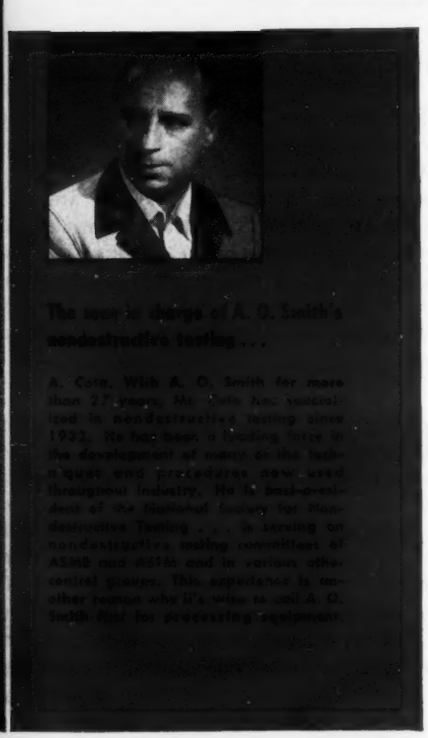


Still another method of flaw detection used by A. O. Smith is the magnetic particle test. Magnetic particle tests are ideal for detecting surface and sub-surface faults in ferrous materials. In this picture, technicians are shown inspecting the welds on a pressure vessel.



Ultrasonic testing (inspection utilizing high-speed sound waves) is another method A. O. Smith uses for quality control of heavy sections. The picture shows an additional application of ultrasonic testing — operator is determining wall thickness of 167,000-lb. vessel.

Nondestructive inspection is one more reason for the dependability of A. O. Smith vessels, exchangers and other process equipment.



Illustrated here are just a few of the nondestructive testing processes by which A. O. Smith maintains the quality of its products. Of course, there are many other tests, too — both nondestructive and destructive — all designed to help create equipment that will excel in your operations.

A. O. Smith was one of the members of the original committee that first established radiographic inspection techniques and standards. Also, we have used magnetic particle testing since 1934 . . . ultrasonic testing procedures since 1945.

Through research . . . a better way

A.O.Smith
CORPORATION

PROCESS EQUIPMENT DIVISION
HEAT EXCHANGERS • PRESSURE VESSELS
Milwaukee 1, Wisconsin
International Division: Milwaukee 1, Wisconsin

When inquiring check CP 1146 opposite last page

Pumped fluid is permitted to circulate through the bearings (serving as lubrication), around the stator, and through the magnetic gap.

In order to obtain the required performance, all dimensional tolerances are extremely exacting — from three to five micro-inches for surface finishes, and as fine as 1/10,000 of an inch for surface dimensions.

(Canned motor-pump is a component of a controlled circulation boiler manufactured by Combustion Engineering, Inc., Dept. CP, 210 Madison Ave., New York 16, N. Y.)

(Stone & Webster Engineering Corp., Dept. CP, 350 Fifth Ave., New York 1, N. Y., were consulting engineers for the Possum Point installation.)

(Canned motor-pump is a product of Westinghouse Electric Corp., Dept. CP, 401 Liberty Ave., Box 2278, Pittsburgh 30, Pa. . . . or for more information check CP 1147 on form opposite last page.)

Market potential of fats, oils in drying oil uses

Findings resulting from study of market potential for fats and oils in drying-oil uses, are presented in USDA market research report. Study was conducted on an industry and nation-wide interview basis with paint, varnish, lacquer, and other major users of drying oils, producers of synthetic resins, and oil suppliers.

Marketing Research Report 90 may be obtained from Marketing Information Division, Agricultural Marketing Service, US Department of Agriculture, Washington 25, D. C.

Service will study, report on European research, markets

Complete services for studying and reporting on European industrial and scientific research programs are available to US companies on a contract basis. Services offered include:

1) Foreign market research
2) Investigation of trade channels to obtain qualified distributors
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4) Technical and industrial research

Company has eleven engineer-representatives in seven European countries.

(Services announced by International Processes, Incorporated, Dept. CP, 624 South Michigan Avenue, Chicago 5, Illinois . . . or for more information check CP 1148 on handy form opposite last page.)

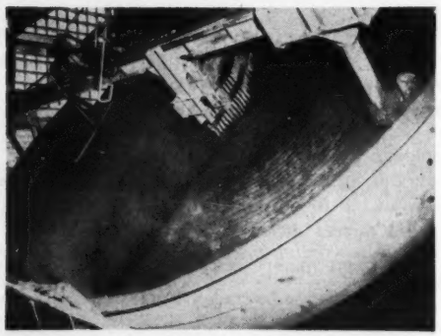
Low-cost ion-exchange process ups yield of sugar from cane, provides pure grade

USDA scientists have experimentally produced a new grade direct-consumption sugar using a low-cost resin ion-exchange process. This sugar can be used directly in many food products without further refining. Yields of cane sugar in the experiments using this process were significantly higher than conventional processes—about 12 to 15 lb more sugar per ton of cane.

Clarified cane juice is passed through beds of ion-exchange resins in the new process. This removes minerals, organic materials, and coloring matter, leaving a product that approximates the appearance of fully refined sugar. Process is said to permit purification of cane juice without loss of sugar through inversion, or hydrolysis, which occurs in use of conventional acid-exchange systems.

This process is accomplished by percolating juice through beds of mixed acid-exchange and base-exchange resins. After saturation, the resins are separated by floating lighter acid-exchange resins to top. They can then be separately regenerated with caustic soda and acid.

Cooperating with the department in the development work on sugar are Godchaux Sugars, Inc., New Orleans, and Louisiana State University. Details may be obtained by writing C. H. Fisher, Chief, Southern Utilization Research Branch, Dept. CP, 2100 Robert E. Lee Blvd., New Orleans, La.



Iron ore will be pelletized on 16-ft diameter discs at International Nickel Company's new $16 million iron ore plant being built near Copper Cliff, Ontario. Discs were developed four years ago in Germany. Shown above is one of several which have been in commercial operation abroad. Pellets are produced without use of binders, plasticizers, or solid fuels.

(Lurgi pelletizing discs are manufactured in US by Dravo Corporation, Dept. CP, 1203 Dravo Building, Pittsburgh 22, Pa. . . . or for more information check CP 1149 on handy form opposite last page.)

WYANDOTTE CHEMICALS

How Wyandotte's Pluronics help you

Makers of shampoos and other hair preparations are enjoying important benefits from the many advantages offered by the Pluronics—Wyandotte's series of 100%-active nonionic surfactants. For, with the Pluronics, it is possible to select a better balance of desirable properties for a given formulation. Some examples:

1. The Pluronics are nonirritating to eyes and skin
2. The Pluronics provide excellent detergency
3. The Pluronics have oil-removal properties which leave the hair soft and manageable
4. The Pluronics are compatible with other shampoo ingredients
5. The Pluronics are practically odorless
6. The Pluronics come in a wide choice of physical forms: liquid, paste, flake, solid cast

What is so different about the Pluronics?

The Pluronics are a unique series of nonionic surface-active agents, based on a chemical concept not previously used in the synthesis of nonionics. Because of their wide range of properties and grades, they offer extreme flexibility in formulation.

With the Pluronics, it is possible to formulate shampoos and hair preparations varying from low-viscosity liquids to flake forms and solids. For each Pluronic grade – including flake – is 100% active, and contains no diluents or fillers.

With the Pluronics, you can prepare a product to meet almost any molecular weight or hydrophobic-hydrophilic balance. For the Pluronics range in molecular weight from 800 to 8000—compared to 300 to 700 for ordinary surfactants.

The Pluronics are the first commercial example of a block-polymer-type surface-active agent. There is no comparable product on the market. Thus, to fully realize their advantages, you must thoroughly investigate them in your own laboratory.

Evaluate the Pluronics as a basis for an entirely new approach in formulating . . . they may prove the key to compounding concepts that open up new avenues of progress for your company.

Are the Pluronics safe to use?

The Pluronics have an unusually low order of eye irritation. Extensive tests have also shown that the Pluronics are not primary sensitizers for human skin. In fact, because they are nonionic and are neutral in pH, the Pluronics are considerably less irritating to the skin than the ordinary anionic and cationic types of detergents. Generally, they may be used safely by persons with sensitive skin, as well as by those allergic to soap.

What about grease removal?

The grease-removal properties of the Pluronics are directly related to their hydrophobic-hydrophilic balance. Since a series of Pluronics is offered, it is possible to select the Pluronic with exactly the grease-removal properties desired. By leaving the proper amount of hair oil, the Pluronics impart a desirable sheen to the hair, and make it much easier to control immediately after washing. The Pluronics are exceptionally effective, too, in shampoos for dyed hair.

*Report on Wyandotte Pluronics**

formulate better shampoos

Do the Pluronics provide effective detergency?

The objective of shampooing hair, of course, is to remove extraneous soil particles. The Pluronics have exceptional detergency and soil-suspension properties which remove this "dirt" quickly and thoroughly. An important advantage of the Pluronics — as mentioned above — is their ability to perform this function without the unnecessary removal of most of the natural hair oil. And the Pluronics provide good cleaning action, even in hard water.

What about compatibility?

The Pluronics are compatible with all types of products commonly used in shampoos. Being nonionic, the Pluronics are completely compatible with soap and other anionic surfactants, with quaternaries used in dandruff-remover shampoos, and with water of any hardness. In addition, the Pluronics are compatible with auxiliary materials, such as dyes and perfumes—and they may also serve to solubilize some types which have limited water solubility.

Can the Pluronics be combined with high-foaming agents?

Yes. As with grease removal, the lathering properties of the Pluronics are related to their hydrophobic-hydrophilic balance. More hydrophilic members of the series have initial lathering properties approaching those of alkylarylsulfonates. Generally, however, the Pluronics are low foaming. In shampoos where lathering is of prime importance, the Pluronics may be successfully combined with high-foaming agents.

Are the Pluronics used in many other hair-preparation applications?

Because of their wide range of properties and flexibility of formulation, new uses for the Pluronics are being discovered practically every day—and the end is nowhere in sight. Besides their use in standard and specialty shampoos, they are being used in hair tonics, special hair preparations, hair bleaches, sun-tan lotions, stick deodorants, perfumes, shampoo bars for animals —to name just a few.

Send for samples and full data

Call your local Wyandotte representative, or write us direct. We will supply the proper samples of the Pluronics, a data sheet summarizing their physical and surface-active properties, technical information on the use of the Pluronics in shampoos, and prices. Write us today . . . or mail coupon below. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

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Wyandotte
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Wyandotte Chemicals Corporation
Inquiry Section CP, Wyandotte, Michigan

Please send:

☐ Data sheet on the use of Pluronics in shampoos
☐ Samples of Pluronic L64 (liquid), F68 (flake) for use in shampoos
☐ Data on Pluronics for (state application): _____

☐ Have your representative call on me

Name _____

Firm _____ Title _____

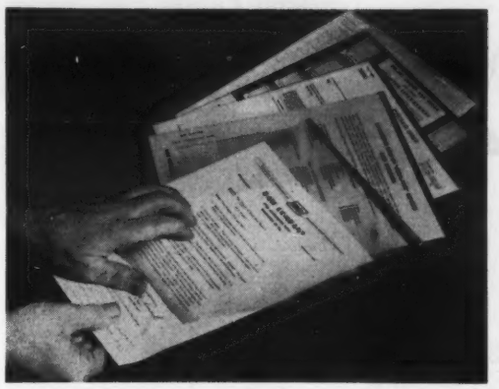
Address _____

City _____ Zone _____ State _____

When inquiring check CP 1150 opposite last page

Data protected, routing speeded with color-coded, transparent document holders

Important documents that require routing, multiple handling, and quick reference can be protected from grease, dirt, water, and smudgy fingers by enclosing them in color-coded, transparent acetate holders. Each holder consists of a heat-folded sheet of scratch-free, flame-resistant acetate, closed at one edge with colored tape. Remaining two edges are open for easy insertion or removal of the routed data. Once filed, contents can be easily seen. Colored tape provides fast identification in current or permanent files.



Flame-resistant, transparent document holders are closed at one edge with color-coded tape

Item is available with five different color-coded taped edges. Standard size is 8½ x 11". Thickness of acetate sheet is 0.005". Folders are also available in other sizes to meet individual requirements.

(Dub'l-vue route-and-file holders are products of Baw Company, Dept. CP, 9704 Frankstown Road, Pittsburgh 35, Pa. . . . or for more information check CP 1151 on handy form opposite last page.)

New torsion testing machine designed for Army Ordnance

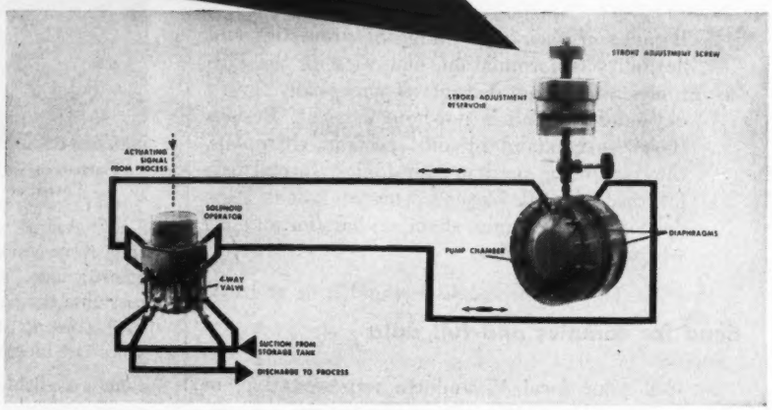
An improved torsion testing machine designed to fulfill requirements of the Army Ordnance Corps is described in 22-page report. Unit not only produces shear fractures but permits accurate determining and recording of energy and torque values and indicates how the applied torques and specimen's resistance fluctuate during testing.

To obtain research report PB 111613, "Improved Method for Testing in Torsion Impact," June 1954, remit 75c direct to Office of Technical Services, US Department of Commerce, Washington 25, D. C.

NOW! Downhill metering!

the new MILTON ROY −ΔP PUMP (MINUS DELTA P)

In operation, the four-way valve admits fluid to one side of the pump chamber, forcing a slack diaphragm to displace fluid from the opposite pump chamber. This procedure reverses on the next cycle. The pacing valve can be operated manually, mechanically, electrically, or pneumatically.



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LITERATURE

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SEE IT

at the Milton Roy exhibit, "25th Exposition of the Chemical Industries," Dec. 5-9, Convention Hall, Philadelphia, *Booth 313.*

Downhill metering (controlled volume pumping from higher to lower pressures) is now practical. The **−ΔP** pump uses a new concept in controlled volume pumping to meter clear fluids (liquids or gases) wherever suction pressure is at least 5 psi greater than discharge pressure.

External power sources are often unnecessary since the **−ΔP** pump can use the potential energy of the fluid (stored either under pressure or in an elevated location). The basic leakproof diaphragm design (for both meter and pacing valve) and a wide selection of materials of construction make the **−ΔP** pump particularly adaptable to handle corrosive or hazardous fluids. For specification data, write for Bulletin 955 . . . to Milton Roy Co., 1300 E. Mermaid Lane, Phila. 18, Pa.

Engineering representatives in the United States, Canada, Mexico, Europe, Asia, South America, and Africa.

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CHEMICAL FEED SYSTEMS

When inquiring check CP 1152 opposite last page

Controlling error of measurement is big factor in effective process control . . .

should be considered when adapting statistical quality control methods to chemical processes

Although statistical quality control has been used in mechanical processing for some time now, it has only recently begun to find wide acceptance in the chemical field. In most respects the statistical control of a chemical process is not much different from any other type of statistical control, but there are some factors peculiar to the chemical field which should be considered when adapting such a program to chemical processes.

Presence of an appreciable error of measurement is one of the most distinguishing features of chemical process control. This is demonstrated by the fact that in many cases it is possible to prepare a mixture from measured quantities more accurately than it is for a laboratory to separate or segregate the constituents for analysis. Presence of this error has two important consequences in chemical process control. It means that 1) control of this measurement error is an essential prerequisite to any effective process control, 2) the degree of control which can be exercised over the process is limited by the magnitude of the controlled measurement error.

Errors in chemical measurement can be generally considered as arising from one of two sources, laboratory error and sampling error. Which one of these two is more important depends on the circumstances involved. In the case of solutions, error of sampling is minor and analytical error is the controlling factor. When working with a material such as coal, the reverse is true. All sources of error must be controlled if effective control is to be had.

Continuity is another distinguishing feature of chemical processing. A process which shows a state of control for batches produced within a single day may show a lack of control if we supply the same basic variation to obtain control limits for daily averages. There are not only batch-to-batch variations, but also day-to-day variations, week-to-week variations, etc., all of which are combined into the total variation in the process. About the only way to control this situation is to think in terms of "long term" and "short term" control, using a different basic variability to set control limits in each instance.

Two other features of chemical processing control which should be emphasized are: 1) the frequent inability to remove known sources of error, and 2) the frequent lack of symmetry in the distributions encountered. In the former, there may be certain sources of variability of lots produced which are perfectly easy to discover but very difficult to eliminate. Usual terminology of assign-

able and chance causes may be very misleading in these instances. Lack of symmetry in distributions is particularly true in the control of very pure compounds or in the control of trace impurities. These situations may call for one-sided control limits based on some type of skewed distribution.

(Summary of paper by Mr. Carl A. Bennett, Hanford Atomic Products Operation, General Electric Company, Dept. CP, Richland, Washington.)

Ultrasonic vibrators speed up pickling, plating . . .

radiate 19,800 cycles per second, remove oxides in 10 to 90 seconds

Ultrasonic vibrators are being used to accelerate and improve pickling, descaling, and metal plating processes. Known as "Sonicells", the welded stainless steel devices are impervious to most corrosives, and radiate vibrations at 19,800 cycles per second.

Used in the "Sonistrip" process, the vibrations and accompanying cavitation speed activity of the solutions to remove rust, oxides, and scale in 10 to 90 seconds — compared with 10 minutes to one hour required by conventional methods. Interior surfaces and crevices are cleaned as rapidly as outer surfaces.

Better platings and fewer rejects are also reported with the "Soniplate" process. Cavitation causes rapid replacement of exhausted liquid layers surrounding the anode and cathode and increases the plating current by two to 100 times. No "burning" has been noted and edge build-up is minimized. Throwing power is also increased and anode polarization is said to be entirely eliminated.

In both processes, the hermetically-sealed vibrators are installed one to each square foot of tank side or bottom area. For small-scale production the devices are powered by electronic generators. Large arrays are driven by motor-alternator equipment.

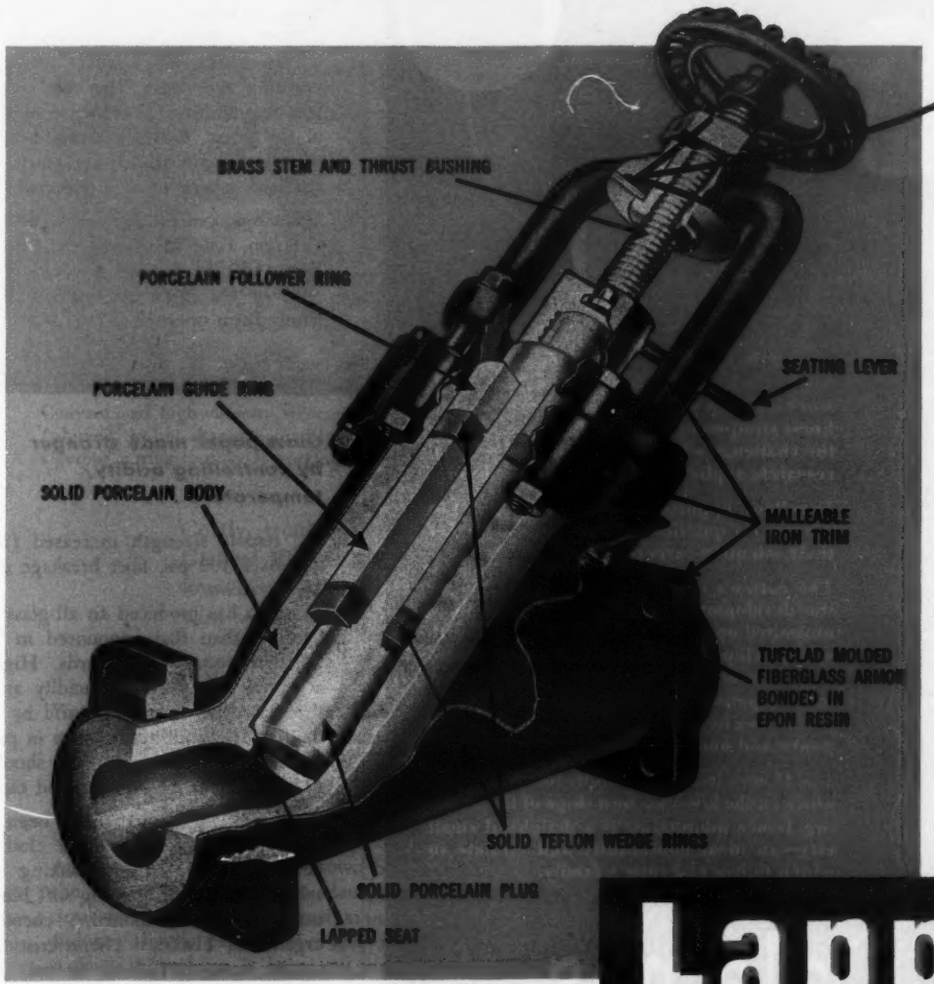
(Ultrasonic vibrators and metal processing techniques were developed by The General Ultrasonics Company, Dept. CP, 1240 Main Street, Hartford 3, Conn. . . . or check CP 1153 opposite last page.)

Put your finger on ideas

. . . materials, equipment and services through our handy Product Directory, starting in this issue on page 255. This "quick-locator" lists all products, with page references.

A "cushioned" porcelain-to-porcelain seal in the Lapp Valve

The chemical resistance qualities of the Lapp Valve come from the fact that the body and plug are both *solid porcelain.* Porcelain, as a material, however, has little resiliency or "give" when the plug hits the seat in the body. Special spring-loaded "cushion" seating in Lapp valves prevents damage from a heavy-handed operator, and warns when seal is tight. Built into the thrust bushing of every Lapp Y-valve and angle valve, is an arrangement of tempered Beryllium copper spring washers. This spring loading also provides that a closed valve will maintain its tightness even under vibration and thermal movement of parts.



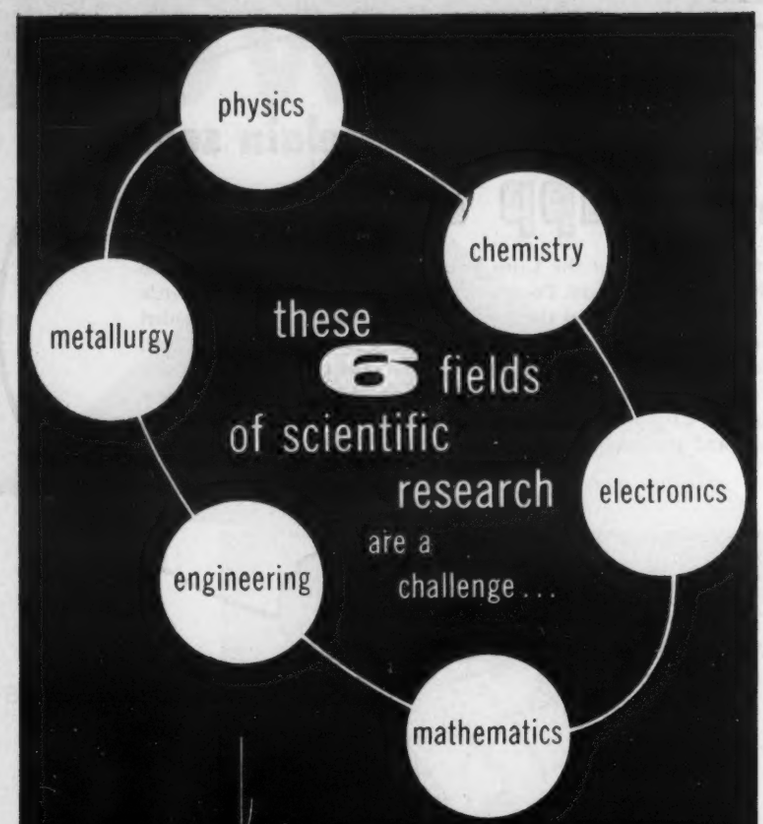
V-valves, angle valves, flush valves, safety valves, and plug cocks of Lapp Porcelain have standard bolt-circle flanges for easy connection to all piping and equipment. Write for bulletin with complete description, characteristics, and specifications. Lapp Insulator Co., Inc., Process Equipment Division, 434 Wendell St., LeRoy, N. Y.

Lapp

PROCESS EQUIPMENT

Chemical Porcelain Valves • Pipe • Packing Rings
Pulsafeeder Chemical Proportioning Pumps

When inquiring check CP 1154 opposite last page



. . . and the scientific and engineering personnel of the Los Alamos Scientific Laboratory working with some of the Western World's finest equipment and facilities—are meeting the challenge with independent and original research, application and development work.

Excellent opportunities now exist at Los Alamos for qualified men wishing to further their scientific careers.

The nation's most important institution for the development of atomic weapons, offers unlimited opportunity for individual growth and development. In addition to its continuing and ever expanding achievement in nuclear weapons research, the Laboratory is now pioneering in the fascinating fields of nuclear power and nuclear propulsion.

Los Alamos itself, beautifully located among pines on the lower eastern slope of the towering Jemez mountains, is a delightful small city—an ideal community and climate in which to live and raise a family.

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los alamos
scientific laboratory
OF THE UNIVERSITY OF CALIFORNIA
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No silicate scale formation in H_2O_2 bleaching . . .

peroxide bath stabilized and made alkaline by use of phosphates and other chemicals

New process for continuous hydrogen peroxide bleaching of textiles eliminates possibility of silicate scale formation in the J-box and auxiliary equipment — a condition heretofore unavoidable in continuous bleaching systems. In the new process, the hydrogen peroxide bath is stabilized and made alkaline by use of phosphates and other non-scale forming chemicals. Bleaching equipment in itself is no different from that used in conventional processes. Process has been in successful commercial use for over a year.

Scale formation has been troublesome in the past because it abrades the cloth and results in rub marks or lay marks which affect quality of dyeing and finishing operations. The condition also necessitated frequent shutdowns for scale removal and cleaning of the J-box. Either a caustic boil-out of the J-box or a buffing with silicate cutting compound was required whenever this occurred.

(Bleaching process was developed by Becco Chemical Division, Food Machinery and Chemical Corporation, Dept. CP, 34 Sawyer Avenue, Buffalo, New York . . . or for more information check CP 1156 on handy form opposite last page.)

Glass paper made stronger by controlling acidity, temperature . . .

tensile strength increased from 30-40 psi to over 300 psi, fiber breakage decreased

Research has produced an all-glass paper eight times stronger than that announced in 1951 by the National Bureau of Standards. Higher strength was achieved by controlling acidity and temperature of the glass fiber suspension and by minor changes in mechanical handling of fibers in paper mill. Because of this greater strength, paper should prove useful in gas masks, chemical filters, and electrical equipment.

Although glass fibers have been widely used for some time in textiles, filter cloths, and in plastic laminates, their use in making all-glass paper is relatively new. Resembling soft blotting paper, product resists heat, moisture, chemicals, and microorganisms. Electrical characteristics are good. Low tensile strength (30 to 40 psi) of original paper made it necessary to use utmost care in production, storage, and handling. New paper has tensile strength of over 300 psi — making it more practical for commercial manufacture and use.

In the improved glass paper making process, beating is conducted at 85°F, and pH of the glass-water mixture is adjusted to 3.5 or less by adding sulfuric

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When inquiring check CP 1157 opposite last page

acid. Under these conditions, the fiber bundles open up and are dispersed more quickly, less fiber breakage occurs, and resultant paper is stronger.

Mechanical changes made have helped to eliminate strings or lumps in finished paper. Because glass fibers in stock flow system tend to accumulate on any projection or rough place, sharp angles were eliminated from the piping. A horizontal stock chest with agitators moving in a vertical plane was also installed so that fibers would fall back into liquid instead of accumulating in strings as they do on horizontal agitators.

When the fiber suspension was brought to a pH of 3.0 as it entered the jordan, it was found possible to pass it through the jordan refiner without damage to the fibers, a step that had been previously impossible. Treatment in jordan also helped break down strings and knots, resulting in an improved finished sheet.

(Improved glass-fiber paper was developed by National Bureau of Standards, US Department of Commerce, Washington 25, D. C.)

L'Azote ammonia process available in US . . .

uses coke-oven or refinery gases; should be of special interest to steel industry

European L'Azote process for making synthetic ammonia from coke-oven or refinery gases has been made available to the US. Developed in Belgium, process is reported to provide higher efficiencies and better utilization of waste heat than other synthetic ammonia processes. Process should be of special interest to the American steel industry. Increased use of natural gas has resulted in a dwindling of revenues from coke oven gas sales.

European companies have been using the L'Azote process for some time. A conventional low-temperature separation process is used initially to separate the components of coke-oven gas. Hydrogen from the separation is combined with nitrogen (taken from air) and introduced into the L'Azote synthesis phase, resulting in the formation of ammonia. Remaining products from the coke-oven gas separation are used to make other chemicals.

As a sidelight, it is interesting to note that if all the hydrogen available from coke-oven gas produced in the US were converted into ammonia, more than 11 million tons per year of synthetic ammonia could be produced. This is almost three times the goal set for 1957 by the Federal Government.

(L'Azote ammonia process is available in US from Koppers Engineering and Construction Division, Koppers Company, Inc., Dept. CP, Koppers Building, Pittsburgh 19, Pa. . . . or for more information check CP 1158 on handy form opposite last page.)

KILL FOAM THE EASY WAY...

New G-E Anti-Foam 60 disperses easily—pays for itself

CONVENTIONAL ANTI-FOAM

Conventional high-viscosity silicone anti-foam agents (above) do not disperse readily in water—require vigorous stirring to prepare working concentrations.

NEW G-E ANTI-FOAM 60

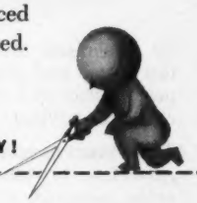
Low-viscosity G-E ANTI-FOAM 60, however, can be *poured*—and disperses instantly!

Costly, troublesome foaming can now be controlled—more easily—with General Electric's new ANTI-FOAM 60. The superior dispersibility of this low-viscosity emulsion means that it can be used as supplied, or readily reduced with water to any desired concentration. Little or no stirring is required.

PAYS FOR ITSELF

You'll find ANTI-FOAM 60 pays for itself by the way it reduces processing time, eliminates costly boil-overs, increases kettle capacity. Incredibly small amounts are needed, for example: 5 PPM in yeast fermentation, 10 PPM in latex stripping and coatings, 50 PPM in pulp processing.

An addition to G.E.'s well-known SS-24 and SS-66, the new ANTI-FOAM 60 is designed primarily for aqueous systems, finds application in practically every industry—textile, paper, rubber and chemical—to name a few. Where can it help *you* control foam? *Try ANTI-FOAM 60 at our expense!*



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GENERAL ELECTRIC

When inquiring check CP 1159 opposite last page

point of interest to **pump users...**

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● Chemiseal Mechanical Seals last longer and give unsurpassed performance in a wide variety of chemical services.

Three years of actual field experience has proven it—handling acids, alcohols, alkalies, hydrocarbons; clear, abrasive and tarry materials.

Features: Seal rotates with shaft. Only bearing surface is between precision ground rotating and stationary faces. Combines chemically impervious TEFLON with a balanced bellows design.

Low friction load on shaft. Lower power cost.

No scoring of shafts. Even shafts already scored can be satisfactorily sealed.

Pressures at seal up to 100 psi at 75°C or 75 psi at 100°C.

Sizes from ⅛" to 2⅛". Maximum length 2¾". Other sizes for special applications.

Write for Bulletin No. MS-954.

UNITED STATES GASKET COMPANY
CAMDEN 1, NEW JERSEY

USG FABRICATORS OF FLUOROCARBONS & OTHER PLASTICS
Representatives in principal cities throughout the world

When inquiring check CP 1160 opposite last page

Workers' aptitudes for specific job told by psychological tests . . .

plant management can conduct own program with test materials furnished in handy kits

The use of psychological tests to guide plant management in determining which workers should get specific job assignments has won wide attention. Companies have been availing themselves of such methods of qualifying workers — thus assuring selection of only the best qualified workers, according to their own specified standards of success.

A new system by which a plant can pre-check the tests has been developed. This is made possible by special test materials furnished in well-organized convenient kits, which include all essential materials. The tests measure unique or different aptitudes; measure them in as simplified and rapid a way as possible, and allow for group testing. A client may use the tests on an experimental basis, after which the plan may be adopted permanently. Employes are given the tests and are then classified into three groups. The papers are returned to the organization furnishing the kits from which a tailor-made kit for the plant can be developed. A graphic report showing the tests' effectiveness is submitted to the client. The field of psychological research has progressed to the point where one no longer refers to "general" aptitude, but rather to "specific" aptitudes. Research indicates that aptitudes are specific not only to the jobs, but even to the plants in which the jobs are found. For example, "mechanical aptitude" may not be enough to measure an employe's success in production for one plant and quality in another.

Material in the kits includes eight paper and pencil tests. These provide a means of measuring major aptitudes basic to learning or performing, in most skilled jobs. The aptitudes include precision, reasoning, dexterity, numerical facility, language facility, and others. Test procedures not only aid in selection of workers for specific jobs but screen out those least qualified prior to hiring.

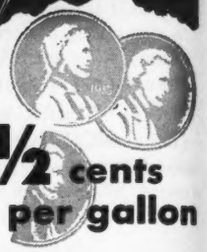
(Aptitude measurement kits and service are available from Monitored Personnel Measurement, Dept. CP, 412 Albee Building, Washington 5, D.C. . . . or check CP 1161 opposite last page.)

First technical progress report issued by Air Pollution Foundation

Projects conducted and results obtained by the Air Pollution Foundation during 1954, are reported in 89-page technical report. Book defines Los Angeles air pollution problem, examines status of research programs, and discusses immediate goals.

To obtain "First Technical Progress Report", remit $4.00 direct to Air Pollution Foundation, Dept. CP, 704 S. Spring St., Los Angeles 14, Calif.

FASTER, EASIER, MORE EFFICIENT CLEANING...



for 2½ cents per gallon

Whether the job calls for cleaning heavy duty tanks of metal, plastic and glass lined, or cleaning general equipment, Alconox combines power with the gentleness that spells SAFELY CLEAN.

Compounded from numerous different chemicals Alconox is blended into a fast acting multiple cleaning detergent that meets your cleaning needs every time—and at 2½ cents per gallon.

Used by leading industrial firms who found it better for such varied uses as cleaning ball bearing assemblies, optical lenses and industrial glass piping systems, after recommendations by their own research departments.

ALCONOX *outsells because it outperforms*

Literature, Samples and the name of your nearest distributor upon request.

For specific problems write or call our Technical Department

AVAILABLE IN

BOX of 3 lb.	$ 1.95
CARTON of 12 boxes of 3 lbs.	18.00
DRUM of 25 lbs. lb.	.45
DRUM of 50 lbs. lb.	.40
DRUM of 100 lbs. lb.	.40
DRUM of 300 lbs. lb.	.37

(Slightly higher on Pacific Coast)

ALCONOX, INC., 61-63 Cornelison Ave., Jersey City 4, N. J.

When inquiring check CP 1162 opposite last page

Highest analysis plant foods in full production at MFA's fertilizer plant . . .

principal products made include 14-14-14, 14-28-14, and 12-36-12 compounds

Highest analysis complete plant foods ever manufactured for general farm use are in full production at Missouri Farmers Association granular fertilizer plant near Joplin, Missouri. Using new process to produce diammonium phosphate, MFA has become first company to make the concentrated granular fertilizers. The $5 million plant attained design capacity of 200 tons per day within three months after start-up.

Principal products to date have been 14-14-14, 14-28-14, and 12-36-12 compounds, each the highest analysis fertilizer of its type ever manufactured. In addition, 11-48-0, 16-20-0, 19-19-0, and 13-39-0

Five-million-dollar fertilizer plant attained design capacity of 200 tons/day three months after start

compounds have been produced. An almost infinite variety of high-grade concentrated granular fertilizers may be manufactured by the process, depending upon ratio in which sulfuric and phosphoric acids are combined with phosphate rock, potash, and ammonia.

Unusual aspect of plant is 4000-foot pipeline through which 94% sulfuric acid is transported across Kansas-Missouri state line for Eagle-Picher plant at Galena, Kansas. Using the Dorrco strong phosphoric acid process, this acid is reacted with phosphate rock to produce 32% P_2O_5 phosphoric acid.

Gypsum, precipitated during the reaction, is separated from the phosphoric acid by three traveling-pan filters. After filtration, the phosphoric acid is concentrated to 37 to 56% P_2O_5 in single-effect evaporators and shipped to other MFA plants or used in the fertilizer production section.

(Fertilizer plant was designed by Dorr-Oliver Incorporated, Dept. CP, Barry Place, Stamford, Connecticut . . . or for more information concerning manufacturer's product, reader may simply check CP 1163 on the convenient Reader Service slip which is located opposite last page.)

Here's the PUMP for hot jobs like these

ALLIS-CHALMERS oil-lubricated pumps have excellent service records on many types of high temperature applications like those shown here. This pump is of simple design, yet has all the features required for low cost, low maintenance operation at high temperatures.

Check the design and construction features that make this possible:

- Built in a wide range of ratings . . . capacities to 3500 gpm, heads to 400 feet.
- Available in wide choice of materials, including iron, bronze, aluminum bronze, stainless steel, high nickel alloys and others.
- Jacketed casing and stuffing box and water-cooled bearings optional.
- Adaptable for packing, mechanical seal or both.
- Simple, accessible design makes maintenance easy.

Allis-Chalmers can supply you with a complete pumping unit — pump, motor and control — all of coordinated design and manufacture and delivered assembled and ready to install. Get complete information from your Allis-Chalmers District Office, or write Allis-Chalmers, Milwaukee 1, Wisconsin, and ask for Bulletin 52B7638.

A-4656

ALLIS-CHALMERS

When inquiring check CP 1164 opposite last page

"THIS LUBRICANT INCREASED BEARING LIFE FROM 2 WEEKS TO 2 YEARS"

—says THE GLOBE COMPANY

"Animal acids and moisture, most harmful to ball and roller bearings prevails in the entire meat packing industry. With conventional lubricants, some of the bearings in our Roto-Cut machines did not last two weeks. Since using Ball Bearing LUBRIPLATE in machines operating continuously 24 hours a day for over two years, we have not had a single bearing replacement."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

When inquiring check CP 1165 opposite last page

Survey covers management development programs

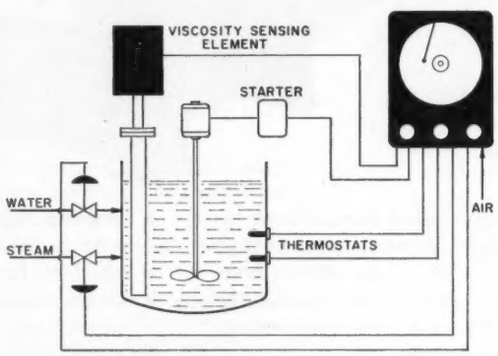
Results of recent survey on management development activity in American industry are presented in 36-page report. Study revealed that 54 per cent of the 460 companies surveyed in 1954-55 have some systematic plan, program, or method to facilitate the development of people in or for management responsibilities. Two per cent of these expressed definite dissatisfaction with the programs.

To obtain Research Report No. 26, "Current Practice in the Development of Management Personnel," remit $1.75 direct to American Management Association, Dept. CP, 330 W. 42nd St., New York 36, N. Y. Specify CP 1166 opp. last page.

Viscometer finishes starch cook and automatically dilutes for final product . . .

recorder-controller cooks starch tailings into size without using lab tests

Starch tailings can be worked up into a usable product by cooking into starch size. Uniformity of product is difficult to maintain with manual or time-control instruments which do not take into account natural variations which exist in starch tailings. Constant laboratory control is one answer. Another solution seemed to be complete automatic control based on viscosity.



Viscosity controller eliminates laboratory determinations

Enzyme starch cooking for size preparation is automatically controlled to finish each batch to same viscosity. System provides for filling kettle with water after size ingredients have been added, mixing and cooking it at proper temperature. After "cook" is finished to proper viscosity, temperature is raised to destroy enzyme effect. Elevated temperature is held long enough to prevent any further action. Water is then added to cool

Xtracts

USEFUL INFORMATION ABOUT REACTIVE CHEMICALS FROM THE DU PONT ELECTROCHEMICALS DEPARTMENT.

New, Peroxide-Resin Technique for Preparation of Peracetic Acid

A new booklet from Du Pont describes the transformation of hydrogen peroxide into a more active form—peracetic acid. The resin technique for peracetic acid is operated simply by passing hydrogen peroxide and glacial acetic acid through a cation exchange resin.

Developed in Du Pont's laboratories, this new process complements the hydrogen peroxide-resin technique for epoxidation. By using peracetic acid prepared by the resin technique, the chemical manufacturer may avoid the disadvantages usually incurred in using peracetic acid. These disadvantages include high costs, handling and storage difficulties and certain hazards.

The resin method can be operated continuously or batchwise. Whether manufactured when needed, or *in situ*, peracetic acid solutions are free of traces from acid catalyst—no neutralization is required.

Some of the organic applications spurred by the use of the new resin technique include: quantitative transformation of olefins into corresponding oxirane (epoxy) derivatives, and dihydroxy derivatives; preparation of Vitamin K analogues by quinone formation; conversion of aromatic ketones to esters; and a host of other organic reactions.

Be sure to get your copy of the new informative booklet on the resin technique for the preparation of peracetic acid. *Check coupon today.*

"Elvadex"—An Unusual Vinyl Polymer

Here's a vinyl polymer with a dual personality. It's readily soluble in aqueous solutions and common organic solvents, but insoluble in acidic or neutral solutions.

This unique solubility points to a number of industrial applications—including textile sizing and finishing, paints, paper coating and adhesives.

Clear, glossy films can be produced from solutions of "Elvadex" vinyl polymer in either aqueous alkali or organic solvents. A wide variety of softeners, plasticizers, and extenders may be used to modify the properties of solutions and films.

Films produced from ammonia solutions are water-insoluble, since ammonia evaporates as solution dries; films from solutions in organic solvents are water-insoluble.

Being a vinyl acetate copolymer, "Elvadex" retains some of the adhesive properties of polyvinyl acetate. Films of "Elvadex" are grease-proof, water-resistant and heat-sealable.

For more information about "Elvadex", check coupon.

Methylene Chloride

Methylene chloride, probably best known for its remarkable solvent power in many fields, is also a versatile tool in the hands of the research chemist. Reacted with organosilanes, for example, methylene chloride yields organosilicon polymers in which the silicon atoms are interconnected by methylene radicals. Similarly, it can be used to insert a methylene bridge between the rings of certain heterocyclic compounds. In other organic syntheses, replacement of the chlorine atoms of methylene chloride with bromine or fluorine yields fire-extinguishing and refrigerating chemicals.

In other fields, methylene chlor-

Continued→

Methylene Chloride (Continued)

ide serves in such diverse applications as in the forming or casting of various cellulose resins, as a solvent and diluent in aerosol formulations, as an ingredient in cleaning compositions, and as a low-temperature heat transfer medium.

These and other uses, together with physical and chemical properties of methylene chloride, are fully covered in a new Du Pont technical bulletin just published. For your copy, be sure to check the coupon.

NaCN—A Starting Point for Profitable Syntheses

Synthesis of sodio malonic ester begins with the reaction of chloroacetic acid with sodium cyanide, followed by hydrolysis and esterification. The resultant malonic ester is reacted with sodium to produce the sodio malonic ester—an intermediate for preparation of barbiturates, other pharmaceuticals.

Quite often, NaCN can be the convenient, practical route for the introduction of a nitrile group or addition of another carbon atom. Some typical reactions include:

Sodium cyanide with:

Sodium chloroacetate
= Sodium cyanoacetate.

Benzyl chloride
= Phenylacetonitrile.

Pyridine sulfonic acid
= Nicotinonitrile.

Acetone = Acetone cyanhydrin.

Formaldehyde
= Formaldehyde cyanhydrin.

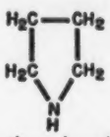
Aniline and formaldehyde
= Phenylglycine.

Ethylenediamine and formaldehyde
= Ethylenediamine tetraacetic acid.

Du Pont can supply NaCN in commercial quantities in high-purity egg, flake or granular form.

New Products

Pyrrolidine



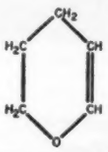
This cyclic secondary amine functions as both a catalyst and reaction intermediate. Unusual compounds can be made by reactions involving addition, condensation, acylation, and alkylation. Highly reactive, this intermediate provides practical routes to useful industrial products, i.e.:

With carbon disulfide, to make *rubber accelerators* similar to those obtained from piperidine.

With alkyl halides, it gives N-alkyl pyrrolidines which can be converted to quaternary bases useful as *sterilizers* and *surfactants*.

Introduction of the pyrrolidyl ring, a physiologically active nucleus found in many natural products such as alkaloids. With ethylene oxide, N-hydroxyethyl pyrrolidine is formed. *Send for Bulletin No. 28.*

Dihydropyran



Colorless liquid.
B.P. ..... 86°C.
Flash point .... –18°C.
Solubility in water at 20°C., 3 g./100 g.
Miscible with common organic solvents.

The reactivity of the double bond makes possible a wide variety of addition compounds. Hydrogenation yields tetrahydropyran, an excellent solvent and chemical intermediate. The following reactions suggest applications for dihydropyran as an intermediate:

With Mono- and Polyhydroxy Compounds..Tetrahydropyryl Ethers
With Hydrogen Bromide 2-Bromotetrahydropyran
Chlorination 2, 3-Dichlorotetrahydropyran
Hydrolysis..Deltahydroxyvaleraldehyde
Write for Bulletin No. 18.

DU PONT
BETTER THINGS FOR BETTER LIVING ...THROUGH CHEMISTRY

CP-10

E. I. du Pont de Nemours & Co. (Inc.)
11507 Nemours Bldg., Wilmington, Del.

Please send me literature and information on:

- ☐ Sodium
- ☐ "Albone" Hydrogen Peroxide
- ☐ "Elvadex" Vinyl Polymer
- ☐ Methylene Chloride
- ☐ Pyrrolidine
- ☐ Dihydropyran

Name_____
Title_____
Firm_____
Address_____
City_____ State_____

When inquiring check CP 1167 opposite last page

prepared size to operating temperature, at same time diluting material to proper density and viscosity. Control of each step is automatic.

System is flexible in that it can be readily modified to perform special functions required for other processes. Starch cooking is controlled to produce smooth, uniform size whose viscosity is automatically recorded. Labor saving is provided by elimination of lab viscosity determinations.

(Viscosity control system is development of Norcross Corporation, Dept. CP, Newton 58, Mass. . . . or check CP 1168 opposite last page.)

Factors affecting chemical reactions in water treatment units

Impartial study of factors influencing chemical reactions in hot and cold process water treatment units is presented in 10-page technical reprint. Considered are effects of preformed precipitates, temperature, chemical excesses, and other factors.

Technical reprint T-134 is issued by Graver Water Conditioning Company, A Division of Graver Tank and Manufacturing Company, Inc., Dept. CP, 216 West 14th Street, New York 11, New York. Specify CP 1169 opposite last page.

Relation of minimum ignition point to other ignition phenomena told

Ignition behaviors of various hydrocarbons and the behavior of ignition improvers in pure form and in mixture with hydrocarbons, are discussed in 15-page report.

To obtain Ignition Studies, Part IV, "Relation of Minimum Ignition Point to other Ignition Phenomena," PB 111614, January 1955, remit 50c direct to Office of Technical Services, US Department of Commerce, Washington 25, D. C.

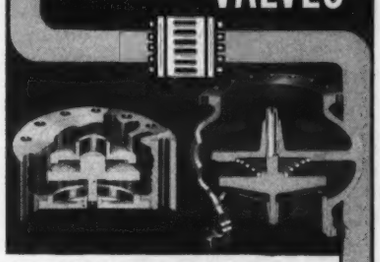
Stresses cooperation on standards between government, industry

Cooperation of government and industry in work on standards is stressed in the proceedings of the third annual meeting of the Standards Engineers Society. The place of standardization in management, and suggestions on how to set up and operate a materials department are also discussed in the 48-page document.

To obtain the Proceedings of the Third Annual Meeting remit $3.00 direct to Standards Engineers Society, Dept. CP, P. O. Box 281, Camden 1, New Jersey. When inquiring specify CP 1170 on handy form opposite last page.

For Positive Low Cost
PROTECTION
of your piping system
Silent Service Since 1929

WILLIAMS-HAGER
FLANGED
Silent
CHECK VALVES



for all piping systems handling water, acids, oils, gas, alkalies, other fluids.

Built to meet exacting service requirements—in sizes from 1" to 20"—Williams-Hager Check Valves will eliminate costly and dangerous *water hammer* in your piping system. Can be installed in horizontal, vertical or angular position. No special tools required. Send for Bulletin 654!

MAIL COUPON TODAY...

THE WILLIAMS GAUGE CO., INC.
146 Stanwix St., 2 Gateway Center
Pittsburgh 22, Pa.

Please send me a copy of Bulletin 654 on Williams-Hager Flanged Silent Check Valves.

NAME_____
TITLE_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE____ STATE____

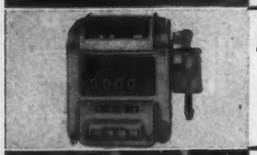
THE WILLIAMS GAUGE CO., INC.
2 Gateway Center • Pittsburgh 22, Pa.

When inquiring check CP 1171 opposite last page

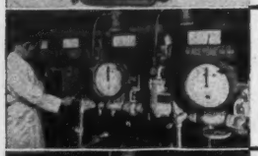
√ Are you saving all you can with Liquid Meters?

Here's a check-list of savings made every day with accurate metered measurement of more than 150 industrial liquids. Chances are *you* can use at least five of these ideas in *your* plant:

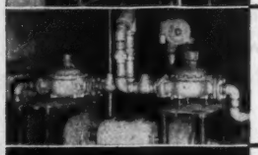
✓ **AUTOMATIC BATCH MIXING:** Meter liquids directly to tanks or kettles with Neptune Auto-Stops. Push buttons to set quantity . . . meter cuts off accurately, automatically. No waiting for weigh tanks to fill, no "inching" up to gauge marks, no wrestling with bags or buckets.



✓ **AUTOMATIC PROCESS CYCLING:** Auto-Stop meters can be equipped with electrical switches to start or stop pumps, agitators, etc. . . . automatically. Saves times, labor, power . . . with closer control.



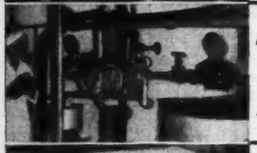
✓ **ELIMINATE REJECTED BATCHES:** In one leading pharmaceutical plant, Neptune meters eliminated human errors, saved enough costly ingredients to pay for the meters in less than a month! How's *your* "reject" rate?



✓ **EASIER INVENTORY, COST CONTROL:** Neptune Meters at key check points keep track of inventory, interdepartmental use, production rates, etc. They put a stop to waste, verify full measure received or delivered.

✓ **AUTOMATIC DRUM FILLING:** This Neptune fills drums, radiators, fuel tanks, etc., with exact quantity every time you press the handle. Saves time, labor, prevents spills or "shorts."

✓ **OIL BURNERS, DIESELS:** Use these low-flow meters instead of bulky day tanks to measure fuel consumed by boilers, melting furnaces, diesels, etc.



✓ **WATER CONDITIONERS:** Trident meter's wary eye tells when ion exchange unit needs recycling. See if yours has trouble-free Trident.

✓ **TANK TRUCK DELIVERIES:** Many industrial liquids can be delivered by metered trucks with greater ease and accuracy than markers, gauges or sticks. Investigate Red Seal meters.

Give you any ideas?

TELEPHONE OR WRITE NEAREST NEPTUNE BRANCH OFFICE FOR QUICK DETAILS—

Or write for Metering Data Book 566-R P

NEPTUNE METER COMPANY
19 West 50th Street, New York 20, N. Y.

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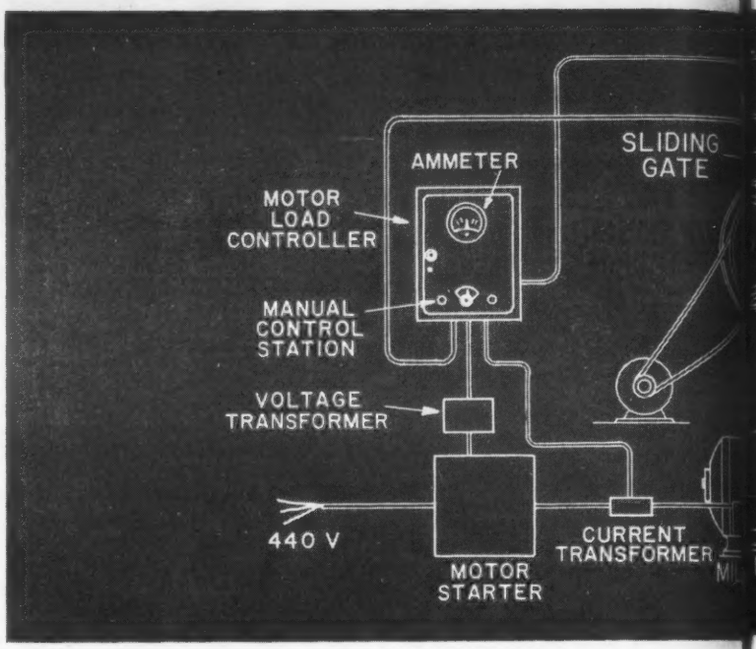
neptune Liquid METERS

When inquiring check CP 1172 opposite last page



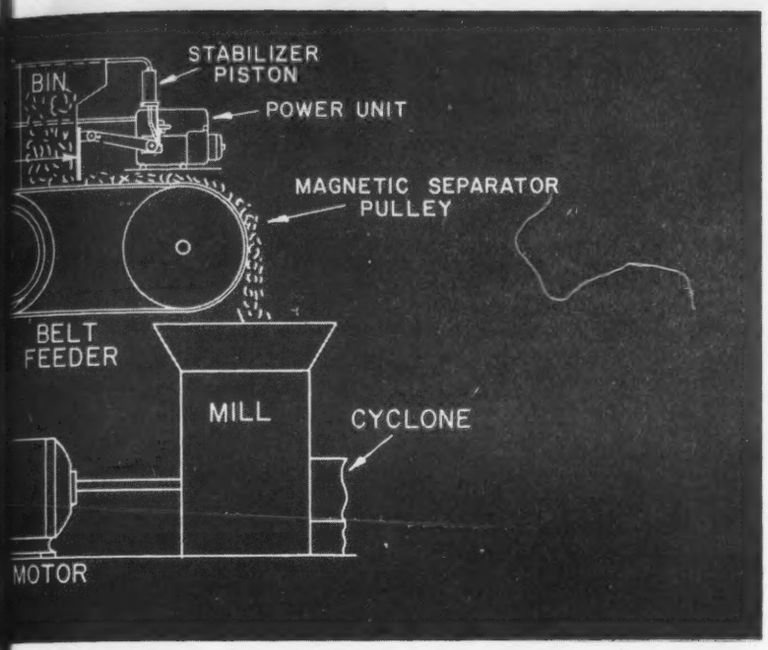
Greater operating efficiency — at less cost — with adoption of motor load controller that . . .

keeps hammermills operating at full capacity

Problem: Regulating the rate of feed input to hammermills, attrition mills, and pulverizers to prevent plugging has long plagued feed manufacturers and other processors engaged in size reduction processes. At Ralston Purina plant in Kansas City an operator was on duty at all times to manually set a gate which controlled the depth of feed material flowing onto hammermill feed belt. If ammeter, connected to the 70 hp drive motors, fluctuated from normal, operator would raise or lower gate accordingly. Manually controlled mills operate far below the efficiencies for which they were designed, and result in high grinding or pulverizing costs.

Solution: With the installation of motor load controller on the grinding operation, Ralston Purina Co. has solved these problems. A relay within the controller measures the flow of electrical current and controls the power unit. Power unit positions the feeder to maintain the proper rate of flow of material to the mill. If amperage decreases, gates are automatically opened, increasing feed to mill. Conversely, with an *increase* in amperage, gates are lowered, decreasing the feed. This control automatically maintains a constant load on the drive motor, which is generally set at maximum load.

Power unit is equipped with a stabilizing piston which was designed to compensate for the time lapse — ten seconds — between the change in feed input to the mill and the corresponding change in current



Sketch shows control arrangement for one of the hamermills

input to motor driving it.

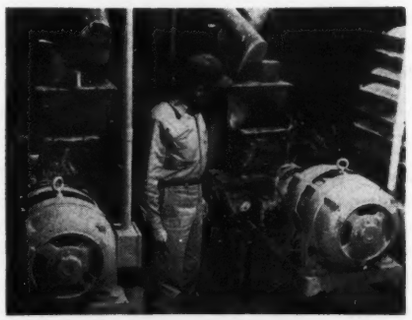
For establishing load on drive motor, which varies according to product being processed, controller has a set-point adjustment. Motor load is indicated on ammeter mounted in the cover of controller case.

Results: Frequent wide and excessive changes in feed input have been eliminated and maximum production with stability and safety has been obtained. Operator now merely sets the gate to maintain full rated load on grinders and drive motor.

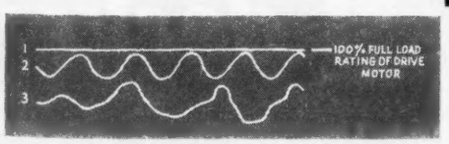
Ralston Purina Co. utilizes a split gate which not only permits feeding two grinders at the same time but acts as a guide in determining the efficiency of the mill. If more feed material is going to one mill than the other, it shows that one mill needs maintenance.

(Amptrol motor load controller, Model MLE, is a development of The Hays Corporation, Dept. CP, Eighth St., Michigan City, Ind. . . . or for more information check CP 1173 opposite last page.)

Operator changes controller set point for particular material being ground

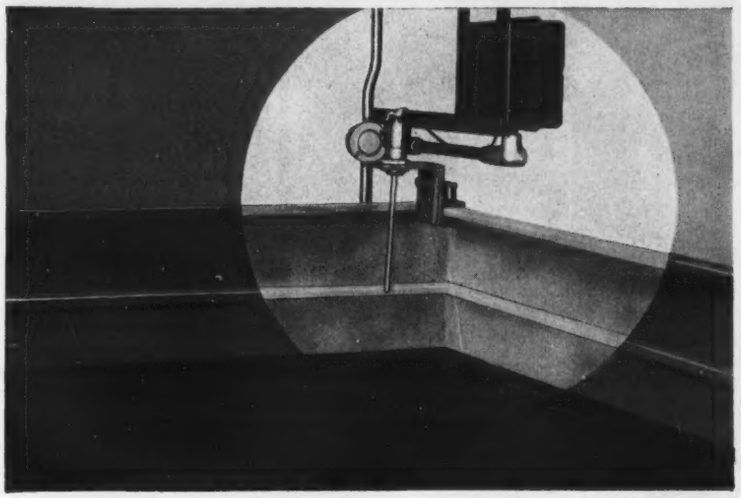


▲ These two hammermills are under control



◀ Comparative load curves show (1) motor load achieved with this system, (2) motor load with on-off control, and (3) manual control

TEKTOR Keeps Hershey Chocolate from Overflowing Open Tank

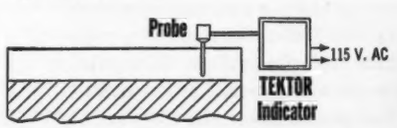


How to keep a 90,000 pound open milk chocolate storage tank from overflowing was the problem faced by the Hershey Chocolate Corporation.

Hershey Engineers found a solution by installing a Fielden TEKTOR High-Level Indicator Controller and Probe. Now, when chocolate level rises to 4 or 5 inches from the tank lip, this simple but dependable instrument flashes and sounds a warning so that the inflow of chocolate can be stopped.

Why TEKTOR Level Control is YOUR Solution

- Indicates or controls level of fluids, powders, solids (conducting or non-conducting)
- Electronically controls level as close as 1/16"
- A ready-to-install unit
- No moving parts . . . only one radio tube
- Regular plant personnel can maintain it
- Low first cost . . . low operating cost.



A TEKTOR probe is installed vertically and its electrical capacity changes when chocolate level is 4 or 5 inches from the lip of the tank. This de-energizes the Indicator relay and switches on the warning light and alarm.

Robertshaw-Fulton CONTROLS COMPANY

Send this coupon today, and find out how Fielden Simplified Instrumentation can solve your process control problems . . . accurately and economically.

FIELDEN INSTRUMENT DIVISION
2920 N. Fourth St., Dept. G, Philadelphia 33, Pa.
Please send me bulletins about your low-cost, accurate controls.

☐ TEKTOR Level Control
☐ Electronic Temperature Control
☐ Resistance Thermometer Recorder
☐ Proximity Meter

NAME _____ TITLE _____
COMPANY _____ ADDRESS _____
CITY _____ STATE _____

When inquiring check CP 1174 opposite last page

for
UNDERGROUND Tanks

The Figure No. 2500 J is an application of the dependable, field-tested, Figure No. 2500 Series Gaugehead. A Figure No. 2500, mounted in this manner equals or possibly exceeds the accuracy of a conventional cone-roof installation. Large, easily read dial has gravity compensator. Float and Neg'ator motor actuated, no counterweights are required. Low pressure model illustrated — also manufactured with flanged connections for working pressures up to 300 p.s.i.g.

Can be used with Varec Remote Gauger Transmitters without disturbing original installation. Also installation may be made on tanks in service.

For additional details contact your nearest Varec representative or write direct.

Varec

VAPOR RECOVERY SYSTEMS COMPANY
2820 North Alameda Street
Compton 1, California
961-11 Cable address: VAREC COMPTON Calif. (U.S.A.) All Codes

When inquiring check CP 1175 opposite last page

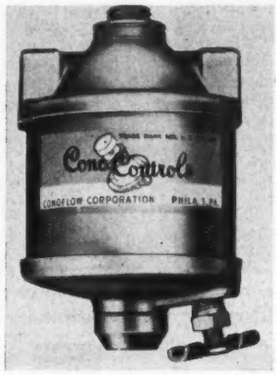
Single-bolt construction for fast replacement of filter . . .

air filter element is capable of removing particles small as 40 μ

Uses: For filtering air to pneumatically-operated instruments, air tools, spray-painting equipment.

Features: Center-bolt construction permits quick replacement of filter element. Element is replaceable Skinner ribbon capable of removing particles small as 40 μ.

Description: Air filter is all-brass construction, has 1/4" NPT connections, and can be supplied with wall-mounting bracket. Filter element is phenolic-resin-impregnated cellulose cylinder which can be cleaned easily by dipping in gasoline, kerosene, or any similar solvent. Filter capacity is 50 scfm and pressure drop across the filter is 15" water. Disposal of entrained water is handled by blowdown cock. Filter areas of six models range from 5 to 27 sq in. Dripwell capacity of models is from 5 to 27 cu in. Overall dimension of filter, excluding bracket, is 4 15/32" for the smallest model and 9 15/32" for largest.



Center-bolt construction permits fast removal of filter element for cleaning

(Model F-1 air filter is product of Conoflow Corporation, Dept. CP, 2100 Arch St., Philadelphia 3, Pa. . . . or check CP 1176 opposite last page.)

Electrical timer designed for fast service check while operating . . .

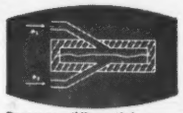
full internal inspection is possible by pulling tab on O-ring retainer

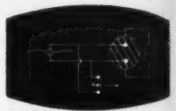
Uses: Timing and sequencing of electrical load circuits on industrial machinery and process operations. Applications include chemical feed proportioning, sequence control, temperature programming, automatic batching, pumping control.

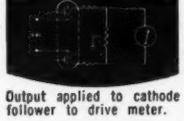
Features: Timer is designed for fast service inspections without interruption of process. Full internal inspection is possible by pulling tab on O-ring retainer at back of cylinder cover.

Description: Unit is automatic reset timer with

- Measures a wide range of static and dynamic pressure for gas and other non-conducting fluids.
- Determines pressure, volume, and temperature variations, fluid flow, expansion, absorption, adsorption, chemical alterations, altitude, vacuum, etc.
- Provides one micron of mercury resolution at atmospheric pressure . . . 7.5 volts output available for recording at a full scale differential pressure of 1 mm of mercury.


Pressure differential moves beryllium-copper diaphragm.


Ionization transducer converts motion into electrical signal.


Output applied to cathode follower to drive meter.

Two-knob control for balance . . . sensitivity.

Just plug this compact, completely self-contained meter into a 115V, 60 cy. line and you're *immediately ready for operation.* Based on the famous **"T-42" Ionization Transducer,** this astonishingly simple pressure instrument, only 5" x 5" x 10" in size, covers the widest range of application. In the laboratory or on the production line, it requires no special accessories, no specially trained personnel.

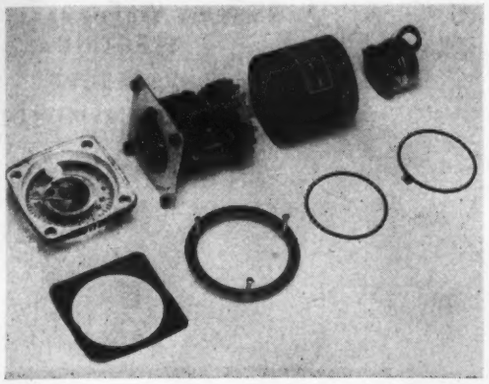
Details on this new micro-sensitive meter are in Instrument Data Sheet 303-1, available upon request to Technical Literature Section,

DECKER AVIATION CORPORATION
1361 Frankford Ave., Philadelphia 25, Pa.

decker

When inquiring check CP 1177 opposite last page

dial setting. Front is one-piece molded acrylic plastic, serving dual purpose of dust-proof cover and seal. Outer surface is smooth and non-dust-collecting. Timer mounts into single cutout 3 3/16" in diameter and is secured by tension studs on back-up ring. It can be installed on panels up to



All components of timer are shown. Unit can be quickly disassembled for service

½" thickness. Only a screw driver and set screw wench are required for complete servicing.

Impingement clutch (metal-to-neoprene) with double bight combines advantages of multiple-tooth and friction clutch disc arrangements. Contacts are self-cleaning, easily interchangeable, and are rated at 10 amp, 115v AC, non-inductive.

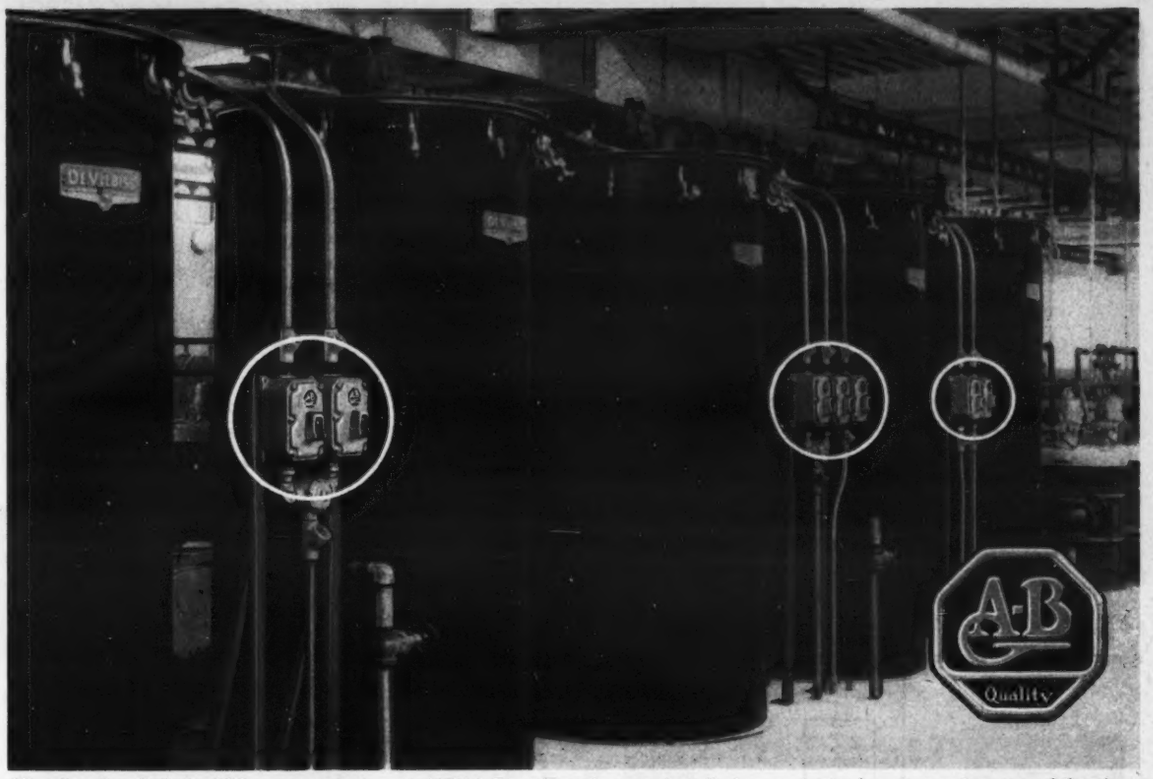
Models cover ten timing ranges from zero to 240 minutes. Minimum settings are from ¼ to 240 sec.

(Atcotrol timer is product of Automatic Temperature Control Co., Dept. CP, 5200 Pulaski Ave., Philadelphia 44, Pa. . . . or for more information check CP 1178 on handy form opposite last page.)

Shows process instrumentation for treating toxic wastes

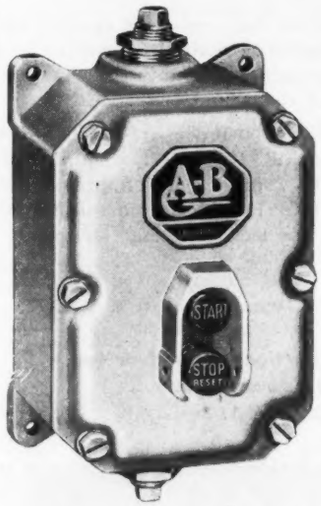
Using flow diagrams, 16-page booklet illustrates most common methods of treating cyanide and hexavalent chromium wastes together with instrumentation for controlling process. Instruments used are illustrated and described. Basic systems for alkaline chlorination of cyanides and sulfonation of chromic acids — batch, continuous, and integrated — are described. Heart of both chlorination and sulfonation processes described is equipment for dissolving chlorine or sulfur dioxide in water.

Bul 90-242-10 is issued by Fischer & Porter Co., Dept. CP, 48 Jacksonville Rd., Hatboro 35, Pa. When inquiring specify CP 1179 on handy form opposite last page.



Allen-Bradley Bulletin 609 manual starters, in NEMA Type 7 enclosures, installed on paint tank agitators in automobile plant

PROTECT YOUR PLANT with A-B EXPLOSION-PROOF STARTERS



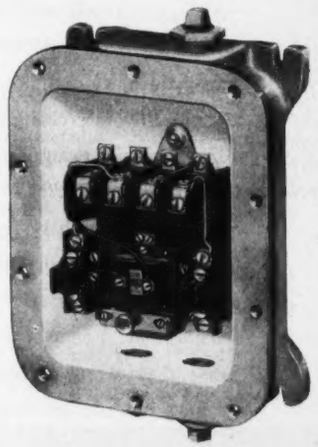
Bulletin 609 Manual Starter
This handy manual starter is in a NEMA Type 7 explosion-proof enclosure for hazardous locations. The bolted cover has a machined flange. Other types of enclosures are also available.

Where explosive atmospheric conditions create a hazard, selecting the correct enclosure for your motor control is as important as picking the starters themselves. Not only does the choice of enclosures have a far-reaching effect on the life and performance of the starters . . . and on your production schedules . . . but very often on the safety of your plant.

A wide choice of enclosures is listed in the A-B Handy Catalog for all Allen-Bradley manual and automatic starters, relays, and pilot controls. Send for this handy reference book on motor controls. Specify the correct enclosure for every operating condition in your plant.

Allen-Bradley Co.
104 W. Greenfield Ave., Milwaukee 4, Wis.
In Canada—Allen-Bradley Canada Ltd., Galt, Ont.

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY



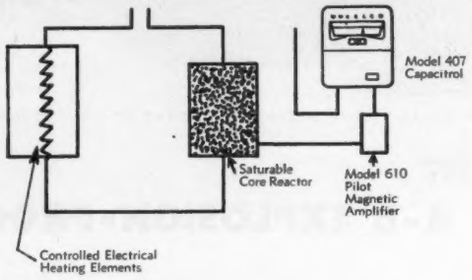
Bulletin 709 Solenoid Starter
This automatic starter is shown in a NEMA Type 7 explosion-proof enclosure, with cover removed to show the magnetically operated switch. Two thermal relays give accurate and continuously dependable overload protection.

When inquiring check CP 1180 opposite last page

BARBER COLMAN

NEW Wheelco 407 Series Capacitrol

More sensitive and flexible temperature controller



You'll like the extra *sensitivity* and *flexibility* of this great new Wheelco Controller. Fully "plug-in," it gives you a wide choice of control forms quickly and easily arranged by interchanging packaged control chassis. Model 407 chassis, for example, provides a true proportioning system that smoothly and *steplessly* proportions *electrical power* input in accordance with system demands. Variations in output of the Capacitrol proportion output to a saturable core reactor so power supplied is *always proportional* to demands of the sensing unit. Easily applied to a variety of continuous process jobs. Assures maximum dependability and accuracy, plus striking new design features never before combined in *one* instrument. For information on other control forms available, write for Bulletin F-6314.

WHEELCO INSTRUMENTS DIVISION

BARBER-COLMAN COMPANY, DEPT. V, 1520 ROCK ST., ROCKFORD, ILLINOIS
BARBER-COLMAN OF CANADA, LTD. • TORONTO & MONTREAL, CANADA

Overdoors and Operators • Molded Products • Metal Cutting Tools • Machine Tools • Textile Machinery
Industrial Instruments • Automatic Controls • Air Distribution Products • Aircraft Controls • Small Motors

When inquiring check CP 1181 opposite last page

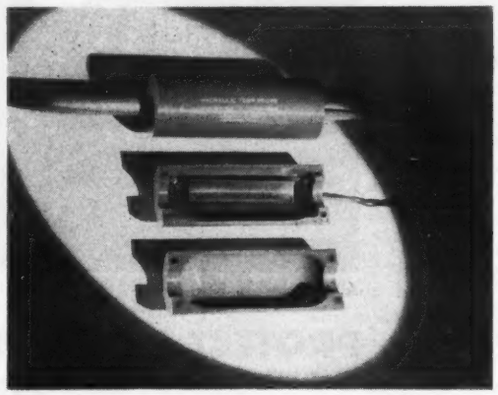
Measures temperatures without breaking into line . . .

saddle-probe is placed against line to measure temperatures to 500°F

Uses: Measuring temperatures without breaking into line.

Features: Probes can be used to measure temperatures from −100° to 500°F.

Description: Split cylinder thermally isolates portion of line against which it is placed. Spring-loaded saddle within the cylinder is brought to bear against line wall. Saddle contains temperature-



Spring-loaded saddle measures temperature

sensitive high resistance element which is wound at 20,000 ohms. High output can be obtained from probe when used in bridge circuitry for relatively small changes in temperature.

(Series 8000 Probes are product of Arnoux Corp., Dept. CP, 1357 S. Hawthorne Blvd., Hawthorne, Calif. . . . or for more information reader may simply check CP 1182 on the convenient Reader Service slip which is located opposite last page.)

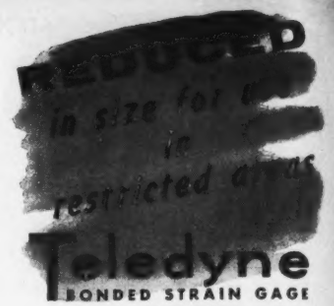
Proportioner is self-driven and has accuracy of 2 to 5% . . .

double-piston water motor is used to inject liquids at rates of 1/100 or 1/200

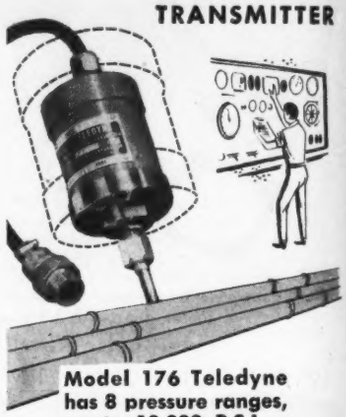
Uses: Proportioning liquids where ratio is approximately 100 or 200 to one and accuracy required is 2 to 5%.

Features: Unit is self-driven and requires no outside power source.

Description: Proportioning pump consists of two-piston double-acting water motor directly con-



ELECTRICAL PRESSURE TRANSMITTER



Model 176 Teledyne has 8 pressure ranges, up to 10,000 P.S.I.

Especially designed for use in applications where space is at a premium, the new Model 176 has all the major features of the larger Model 158 Teledyne with the added ability to withstand overload up to 100%. Only 2¼" in diameter and 3½" long, it is one of the most advanced pieces of equipment of its kind available. It measures, and transmits pressures of gases and fluids to indicating and recording instruments and has a host of exclusive features found nowhere else. Bonded strain gage construction (insensitive to vibration and shock), stainless steel pressure chamber, high frequency response, linear output over full pressure range, temperature compensated for zero shift and sensitivity change. Easily disassembled for clean-out and repairs.

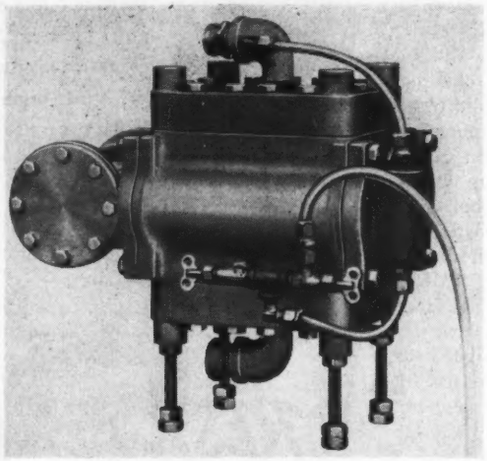
PLEASE NOTE: Contact us for calibration service on Pressure Transducers. 0 to 25,000 P.S.I.

Write for Illustrated Literature

TABER INSTRUMENT CORPORATION
SECTION 46
111 Goundry St., N. Tonawanda, N. Y.

When inquiring check CP 1183 opposite last page

nected to an injector pump. Water enters unit from underneath, passes through motor and is discharged. Proportioned liquid is injected into water at discharge side. Two models are supplied. One for ¾" pipe will handle up to 12 gpm. Pressure drop through unit is 5 to 15 psi depending on rate of water flow. Second model is for 2" pipe and will handle up to 100 gpm. Pressure drop is 5 to 10 psi.



Water pressure drives proportioner

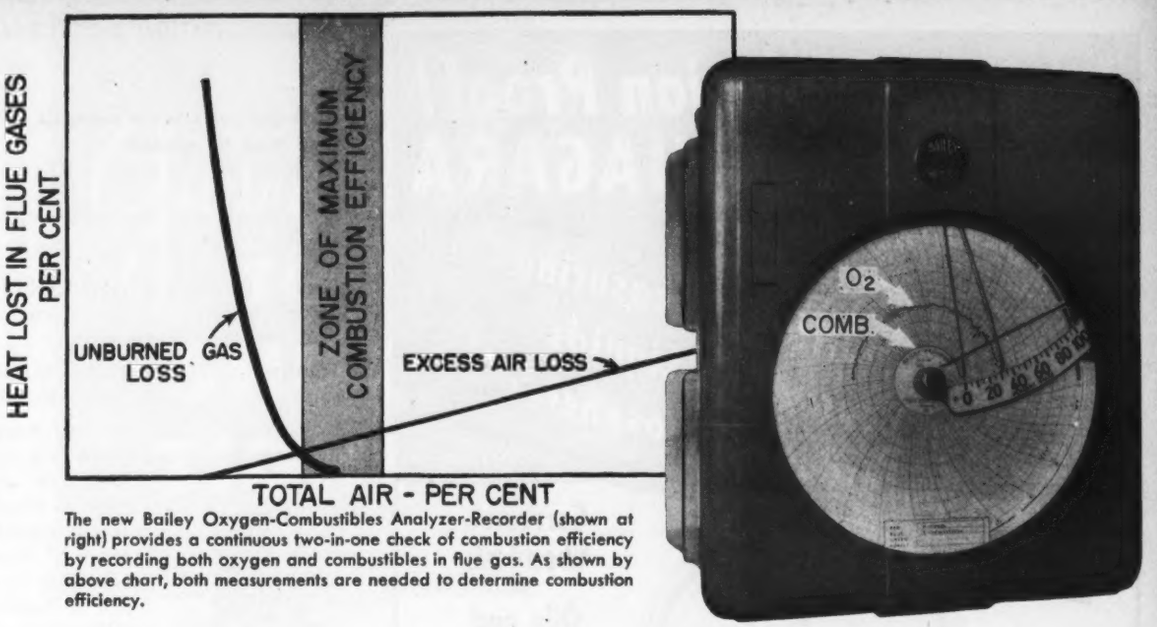
Proportion rates are factory-set and standard settings are 1/100 or 1/200. Minimum pressure for water motor is 30 psi. Material of construction can be bronze, stainless steel, or Monel.

(Measuremix is product of Smith Precision Products Company, Dept. CP, 1135 Mission St., South Pasadena, Calif. . . . or for more information check CP 1184 on the convenient Reader Service slip which is located opposite last page.)

Discusses sequencing control for process equipment

Two systems for obtaining sequence timing control are described in four-page bulletin. Impulse counter method for batch processes is discussed, together with continuous timer method for fully automatic sequencing control. Reasons are suggested for choosing between the two methods according to process requirements. Methods can be applied to operating process equipment in accordance with measurements of total flow or weight.

IDS No. 11.12-1 is issued by Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne & Windrim Aves., Philadelphia 44, Pa. When inquiring reader may simply specify CP 1185 on the convenient Reader Service slip which is located opposite last page.



The new Bailey Oxygen-Combustibles Analyzer-Recorder (shown at right) provides a continuous two-in-one check of combustion efficiency by recording both oxygen and combustibles in flue gas. As shown by above chart, both measurements are needed to determine combustion efficiency.

BAILEY announces . . .
New 2 in 1 way to measure Combustion Efficiency

The new Bailey Oxygen-Combustibles Analyzer-Recorder gives you a continuing double check on combustion economy. It's fast response measures and records:

1. Excess air—regardless of the fuel or combinations of fuels being burned.

2. The mixing efficiency of your fuel-burning equipment—by indicating the amount of combustibles in your flue gas, resulting from incomplete mixing of fuel and air.

Combustion efficiency depends upon fuel-air ratio. Too much fuel can be even more costly than too much air. And because of the interdependence of these two factors, no control that measures only one of them can give you complete protection.

Now, for the first time, you can check *both* with a *single* fast acting instrument, using the new Bailey Oxygen-Combustibles Analyzer-Recorder for industrial furnaces, kilns, heaters and boilers.

Fuel economy improves as excess air is reduced—until unburned fuel begins to show up in the flue gas. When this happens, combustion efficiency drops off sharply if there are further decreases in the air-fuel ratio. That's why combustion gases must be analyzed for *both* oxygen and combustibles to get a true indication of efficiency—and that is why Bailey coordinates both measurements on the same chart, to show when excess air may be reduced safely without danger of greater losses from unburned gases.

The Bailey Oxygen-Combustibles Analyzer is an approved combustion safeguard.

Ask your local Bailey engineer for suggestions on application. Equipment details in Product Specifications E65-1 and E12-5. P31-1

BAILEY METER COMPANY

1074 IVANHOE ROAD • CLEVELAND 10, OHIO

INSTRUMENTS AND CONTROLS — For Power And Process

When inquiring check CP 1186 opposite last page

NOW—Explosion Proof!
A New NIAGARA
Electricontact Meter
for Automatically Measuring and Controlling Liquids in Hazardous Atmospheres

Corrosive Chemicals
•
Oils and Solvents
•
Cold Water and Cold Water Base Liquids
•
Heated Water and Hot Water Base Liquids

For CHEMICAL PROCESSING PLANTS

Shuts solenoid valve or stops pump motor after preset gallonage has flowed through the meter. Opens or closes circuit to actuate any electrical controls. Provides automatic shut-off for batch measurements. Insures accuracy. Saves time. Increases production without increasing man-power requirements. Wide range of sizes and capacities of both Meters and Electricontact Registers.

Design incorporates Model EX-AR Microswitch which carries Underwriter's Laboratories listing for use in hazardous atmospheres, Class 1, Group C and D and Class 2, Group F and G. Electricontact register has new improved heavy duty construction. Used on 110 to 550 V. a.c.

Brings automation to liquid volume measurement and control even in hazardous atmospheres.

For Complete Details Write for Bulletin 35

BUFFALO METER CO.
2892 MAIN STREET
BUFFALO, N. Y.

Representatives in all leading industrial centers

When inquiring check CP 1187 opposite last page

High-pressure level controls designed to operate to 5000 psi . . .

operates with liquids having specific gravity of 0.40 or more

Uses: Controlling liquid level of liquids having specific gravity of 0.40 or more at pressures to 5000 psi.

Features: Three models are available for pressures of 1500, 3000, and 5000 psi.

Description: Control uses bouyancy obtained by displacement of a liquid by a solid. Solid block displacer of glazed porcelain "loads" its weight upon a compression support spring. Rising liquid-level imparts bouyancy to displacer in proportion to liquid it displaces, producing switch-control action. Falling liquid-level subtracts bouyancy to cause low-level switch action. Control is designed to operate with liquids having specific gravity of 0.40 or more.

Chambers are cast steel of flanged design. Gaskets are spiral wound asbestos or ring steel. Type 316 stainless steel compression spring is used where corrosion is a factor. An Inconel compression spring is available for temperatures to 300°F.

(Magnetrols are products of Magnetrol, Inc., Dept. CP, 2110 S. Marshall St., Chicago, Ill. . . . or for more information check CP 1188 on handy form opposite last page.)

Field-positioning relay kit for any air-operated control valves . . .

will help solve valve positioning problems as stuffing-box friction load

Uses: To compensate for undesirable characteristics of diaphragm valves or pneumatically-operated power units. Also used to amplify small changes in pneumatic signals or for sequential control.

Features: As little as 0.065 psig input signal change will apply full output (50 psig max) to valve motor.

Description: Relay kit consists of positioning relay plus six pre-shaped cams supplied for square root, linear, square, and half-travel regulating characteristics. Further field shaping is simplified

It's NEW
MONITOR THERMOCOUPLE CIRCUITS

DETECT and CORRECT thermocouple circuit failures by pushing button on your instrument control panel.

PEERLESS RESTORER

IMPROVES PROCESS ACCURACY . . . CUTS MAINTENANCE COSTS

Why depend entirely on a $10 thermocouple to give your expensive instruments the delicate voltage needed to control critical temperatures? Faulty thermocouples and loose, oxidized or corroded thermocouple circuit connections cause many common pyrometer errors.

Periodic inspection and replacement of couples is a costly way to prevent these errors. Instead, monitor your thermocouples and circuits with the Peerless Restorer. Users have saved as much as $175 per week on thermocouple replacement alone.

Saving $1 per day for a year will repay your firm the Restorer's usual cost. The unit can be installed on your instrument panel, recording errors and corrections on your pyrometer chart. No tubes. Simple electrical circuits require no maintenance.

ONE RESTORER MONITORS MANY THERMOCOUPLES

Peerless Electric

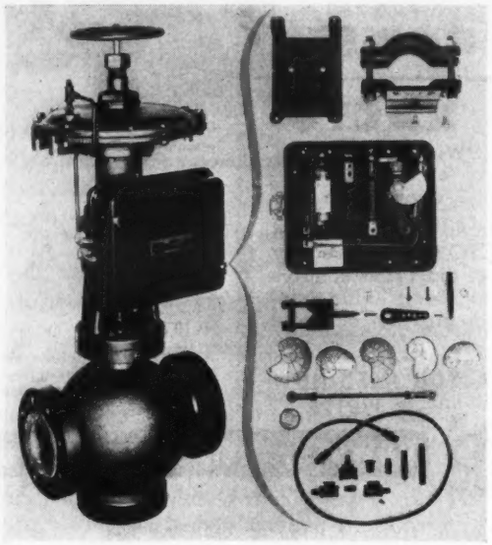
ELECTRONICS DIVISION
THE PEERLESS ELECTRIC CO., WARREN, OHIO
Please send me free catalog R-22

Name_____
Firm_____
Address_____
City_____ Zone____ State____

When inquiring check CP 1189 opposite last page

by polar coordinate imprints on cams. Relay is direct or reverse acting and suitable for top or bottom-connected valves. Standard SAMA signal ranges of 3-15 psig or 3-27 psig actuate a force-balance mechanism.

Any desired relationship between pneumatic signal and position of valve or other final control



Relay kit includes six pre-shaped cams

element can be obtained by cutting cams. Valve positioning problems as stuffing box friction load, poor response, unbalanced inner valves, hysteresis, other undesirable regulating characteristics can be compensated to respond with required characteristics.

(Positioning Relay Kit is product of Bailey Meter Co., Dept. CP, 1050 Ivanhoe Rd., Cleveland 10, Ohio . . . or for more information check CP 1190 on handy form opposite last page.)

Illustrates control system for salt slurries

Outlining consistency and acid-concentration control system for salt slurries, two-page bulletin uses titanium oxide pulp and slurry handling as example. System is suggested to solve problems due to varying quantities of dissolved salts in slurry. Method is suggested for addition of sulfuric acid in sufficient quantities to maintain constant acid concentration, using temperature differential of pulp before and after addition of sulfuric acid as measured variable.

AED 281-8 is issued by The Foxboro Co., Dept. CP, 174 Neponset Ave., Foxboro, Mass. When inquiring specify CP 1191 opposite last page.

Guaranteed TO SHUT TIGHT*

*When equipped with a SECO Metal Seat and Disc on steam service and protected by an approved Strainer, a Spence Regulator is guaranteed to shut tight when the demand for steam ceases.

Expensive steam leaks due to a lack of absolutely tight shutoff are eliminated in Spence Temperature Regulators. Here is why we can make such a guarantee:

First, our temperature regulators are of the single seat design. Seats and discs are made of durable SECO Metal. More than 20 years experience in thousands of installations has failed to produce a single case where SECO Metal has been cut by steam.

These plus other design features explain why Spence Temperature Regulators function dependably and accurately year after year without requiring expensive repairs or special attention.

Want more facts? Write for Bulletin T50 giving full details.

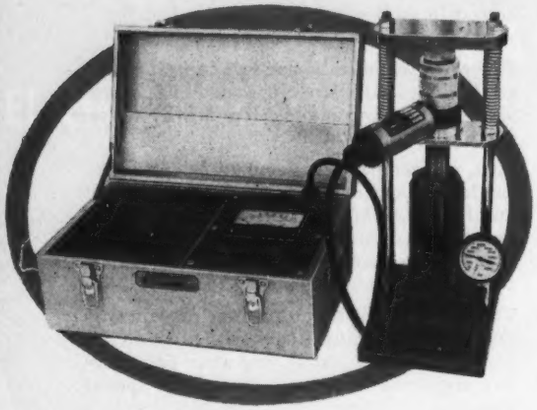
SPENCE TYPE ET150 Temperature Regulator

Spence

SPENCE ENGINEERING COMPANY, INC.
WALDEN, NEW YORK

When inquiring check CP 1192 opposite last page

Moisture Costs Money!



Save the high costs of too much or too little moisture! Measure moisture content quickly, economically with **Granular Moisture Register G5** – insure product uniformity and quality!

1 minute test! No stopping for time-consuming, expensive laboratory tests.

Accurate readings to 0% within close tolerances!

Use on production line! Voltage regulated electronic power supply, or battery operated. No skilled technicians required.

Two Weeks Free Trial! Test the G5 in your plant. No obligation. Satisfaction is guaranteed.

Guaranteed accuracy on these products!

Ammonium Nitrate
Ammonium Sulphate
Plastic Molding Compound
Ammonium Perchlorate
Sodium Bicarbonate
Polyethylene Resins
Dozens more powdered or granular materials, including many foods.

ELECTRONIC MOISTURE REGISTER *Instruments*
Moisture Register Co., Dept. CPA, P.O. Box 910, Alhambra, Calif.

☐ *We are interested in 2 weeks free trial offer. Send additional information regarding Model G5.*
We will want to test _____
in a moisture range from _____ % to _____ %.
Firm Name _____
By _____ Title _____
Address _____
City _____ State _____

When inquiring check CP 1193 opposite last page

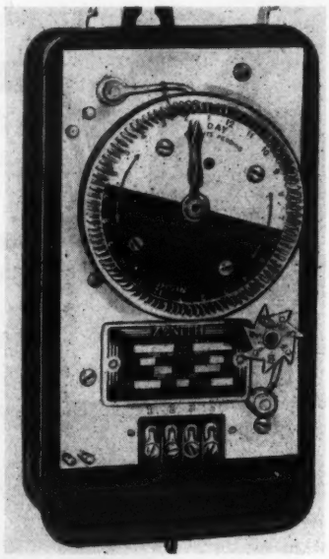
Provides 24-hr control of "off-on" process time cycles . . .

switch is scaled in 15-min units over 24-hr period

Uses: Controlling intermittent process operations, including day or night shutdowns.

Features: Switch is scaled in 15-min graduations over 24-hr period which can be set for as many as 48 "on" and 48 "off" operations.

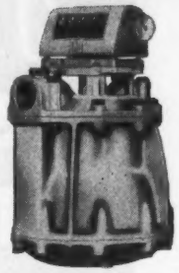
Description: Time-schedule is adjusted by sliding self-contained, non-removable trip levers in or out on the dial. Switch is available with or without calendar device to cut out non-working days. Overall dimensions are 8¼" high, 6½" wide, and 4½" deep. Rated capacity is 1000 watts. Unit operates on 60 cycle, AC, 110 or 240 volts. Switch is single pole-double throw.



Switch is adjusted by sliding trip levers in or out on dial

(Time switch is product of Zenith Electric Co., Dept. CP, 152 W. Walton Street, Chicago 10, Illinois . . . or for more information about manufacturer's product reader may simply check CP 1194 on the convenient Reader Service slip which is located opposite last page.)

Automated
liquid handling depends on meters

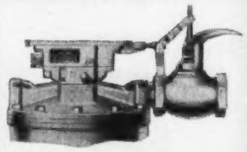


SPECIFY THE INDUSTRY-PROVED **BOWSER**

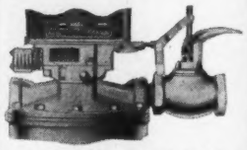
XACTO
Widest selection of models for every plant...

Choose from the world's leading, most widely used line. XACTO meters are easily adapted with choice of dials and controls for changing needs to speed liquid handling operations and provide accurate accounting.

Recording printer mounts on meter. Prints quantity dispensed or received.



Delivers predetermined quantities up to 10,000 gallons, then shuts off.



A repeating control for delivery of predetermined quantities. Automatic. With or less recording printer.

GET ALL THE DATA YOU NEED NOW ...WRITE...

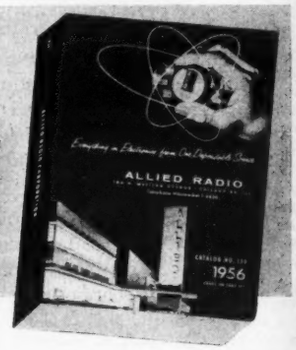
BOWSER ESTABLISHED 1885

BOWSER, INC., FORT WAYNE, IND.
1315 E. CREIGHTON AVE.

When inquiring check CP 1195 opposite last page

free send for the most widely used Electronic Supply Guide

ALLIED'S COMPLETE 324-PAGE 1956 CATALOG



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ALLIED RADIO
100 N. Western Ave., Dept. 72-K-5
Chicago 80, Illinois

send for FREE CATALOG

When inquiring check CP 1196 opposite last page

Complete line of valves for instrumentation

Manufacturer's complete line of valves for instrumentation purposes is described in two-color 46-page bulletin. Descriptions are included of 3- and 4-way pneumatic valves, others.

Industrial Controls Catalog is issued by General Controls Co., Dept. CP, 801 Allen Ave., Glendale 1, Calif. When inquiring specify CP 1197 on handy form opposite last page.

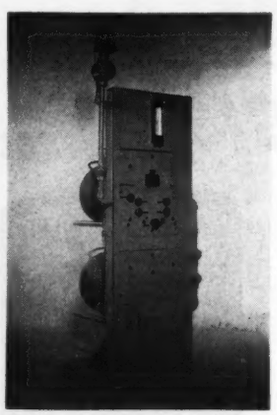
Provides continuous analysis of specific components in gas stream . . .

one to five process streams can be sampled automatically

Uses: Continuous analysis of specific components in gas streams of petroleum products.

Features: Two models are available: One model samples one to five process streams automatically and the other is recommended for single-stream analysis and control.

Description: Radiation from a single infrared source is split and focused into two conical beams. These beams pass through dual sample cell and two individual filter cells. Interfering spectra are blanked out and system is sensitized only to component whose concentration is being determined. After passage through these cells, each beam falls on its respective bolometers. Difference in two bolometer readings causes electrical unbalance. Servomechanism rebalances system, indicating variance in concentration of component.



Gives continuous analysis of petroleum products

Instrument has automatic sample-stream flow control and visual indication of stream being sampled. Continuous readings from stream being sampled can be telemetered for remote recording. Instrument is designed to be explosion-proof under Class I Group D conditions.

(Automatic infrared analyzer is a product of Consolidated Engineering Corp., Dept. CP, 300 N. Sierra Madre Villa, Pasadena 15, Calif. Check CP 1198 on handy form opposite last page.)

NEW BRISTOL 500EW Air-Operated Controller offers proportional band to 400% and reset-plus-derivative control.

New Bristol 500W Air-Operated Controller offers proportional band-width up to 400%

The new 500W Controller, latest addition to Bristol's 500 Series of Air-Operated Controllers, offers better control of difficult processes than ever before. The 500W features:

1. Wider proportional band allows control of difficult processes without cycling or instability. Choice of two band-width ranges from 1% – 200% or 2% – 400% of chart width, adjustable by user. Choice can be made by the user – no extra parts, no special tools, no calibration required.

2. Increased stability, without loss of sensitivity, for smoother control. New internal stabilizing elements insure freedom from short-period oscillations.

3. Wider reset response range to eliminate offset or droop errors in control. Standard reset rate of 0.1 to 10 repeats per minute or fast reset rate of 1 to 300 repeats per minute are available.

4. Increased derivative range, for better response to changing variables. Derivative time adjustable from 0.2 to 20 minutes. Bristol's exclusive zero derivative setting facilitates adjustment of controller to process.

5. Fixed links and levers give built-in calibration for greater accuracy, no misadjustment, low maintenance.

You'll find Bristol's widened line of Series 500 Air-Operated Controllers more than ever adaptable to your control problem – whether for controlling pressures, liquid-level, flow, temperature, motion, speed, pH, electrical values, or other variables. Why not get all the facts on these instruments? Write The Bristol Company, 141 Bristol Road, Waterbury 20, Conn. 5.35

BRISTOL'S

BRISTOL

POINTS THE WAY IN HUMAN-ENGINEERED INSTRUMENTATION

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

When inquiring check CP 1199 opposite last page

now...

more effective and economical

ENTRAINMENT SEPARATION

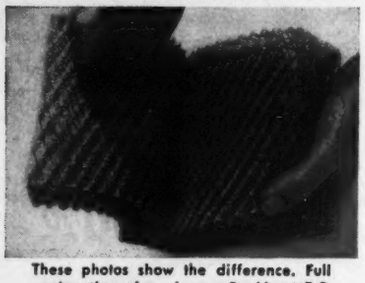
with the

NEW HI-THRUPUT HERRINGBONED MIST ELIMINATOR

Check these important points:

1. Half the pressure drop of Standard Mist Eliminator.
2. Safe operating limits — 10% to 12% higher velocity.
3. Entrainment removal practically 100% over wider operating range.
4. Three to four times longer on-stream life under coking conditions or where solids are present.
5. Lower cost — wires repositioned by Herringbone Fold*.

*U.S. Patent No. 2,565,846, Aug. 28, 1951



These photos show the difference. Full explanation given in our Booklet ME-5.

Send for Revealing Booklet ME-5. Learn how repositioning wires by patented Herringbone process and change in size and contour of mesh openings make this new Mist Eliminator more effective and economical.

METAL TEXTILE CORPORATION

Roselle, New Jersey

Metal Textile Corporation of Canada, Ltd., Hamilton, Ont.

When inquiring check CP 1200 opposite last page

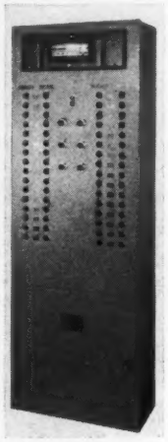
Checks control temperatures at thirty-two stations every 120 seconds . . .

gives audible and visual alarm if any station is "off limits"

Uses: Automatically checking control temperatures in process work, monitoring bearing temperatures of pumps, turbines, and motors.

Features: Unit gives audible and visual alarm should any station be "off limits".

Description: Control center automatically checks temperature at each control station in fixed time interval, 32 stations in 120 seconds. Pilot light indicates point being checked and the amount of correction needed at any point is visually indicated by electronic temperature-indicator. Control center includes temperature indicator, pilot lights, pulse-actuated stepping switch, pulsing timer, and holding relays. Manual reset switch clears alarm indications after temperature corrections have been made. Manual pulsing push-button switch provides means of manually checking any of temperature points.



(Control center is a product of Wheelco Instruments Div., Barber-Colman Co., Dept. CP, 1300 Rock St., Rockford, Ill. . . . or for more information check CP 1201 on handy form opposite last page.)

Instruments for every application . . .

can be found in CHEMICAL PROCESSING's section on Instrumentation and Control. The handy page guide to instruments for your needs is the Product Directory beginning on page 255.

For THERMOMETERS that are DURABLE, ACCURATE, ADJUSTABLE

USE

Rochester Dial Thermometers

Hermetically sealed against moisture and dirt to bring you years of trouble free service.

Recalibrate the dial externally by inserting the stem in liquid of known temperature and adjusting screw attachment.

Designed to be used indoors or out, the stainless steel case is impervious to most corrosive agents.

Rochester Straight-Form Thermometers bring you the added advantage of a stem that can be mounted in any position around the dial.

For additional information contact your Rochester sales engineer or write:

Rochester Manufacturing Company, Inc.

86 Rockwood St., Rochester 10, N. Y.

DIAL THERMOMETERS GAUGES AMMETERS

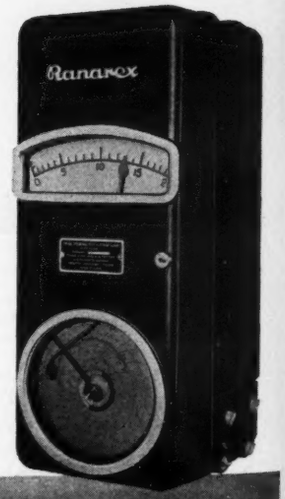
When inquiring check CP 1202 opposite last page

FOR FASTER GAS ANALYSIS OR CONTROL

If the gas component you want to measure or control is related to the *specific gravity* of the gas, a RANAREX will measure it accurately, continuously, *without lag* and at *low cost.*

Works on a simple, mechanical principle . . . rugged, foolproof. Can be equipped for automatic control. Analyzes flue gas to cut fuel costs . . . aids quality control in heat-treating, chemical processing, oil refining . . . checks uniformity of fuel gas, etc.

For details, write to The Permutit Company, Dept. CP-10, 330 West 42nd St., New York 36, N. Y.



RANAREX®

When inquiring check CP 1203 opposite last page

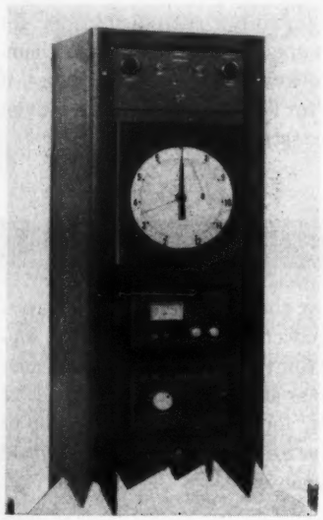
"Packaged" pH system has all components in single unit . . .

factory-built system is piped and wired for plug-in use

Uses: Monitoring, recording and controlling pH processes, single or multiple-channels.

Features: Instrument combines in a single unit all components required for a process application.

Description: Entire system is factory-built. Unit is wired, piped, and assembled ready for plug-in installation. Basic components can be assembled into number of different combinations from the simple combination of pH meter and alarm to a multiple-channel monitor-recorder-alarm-control system.

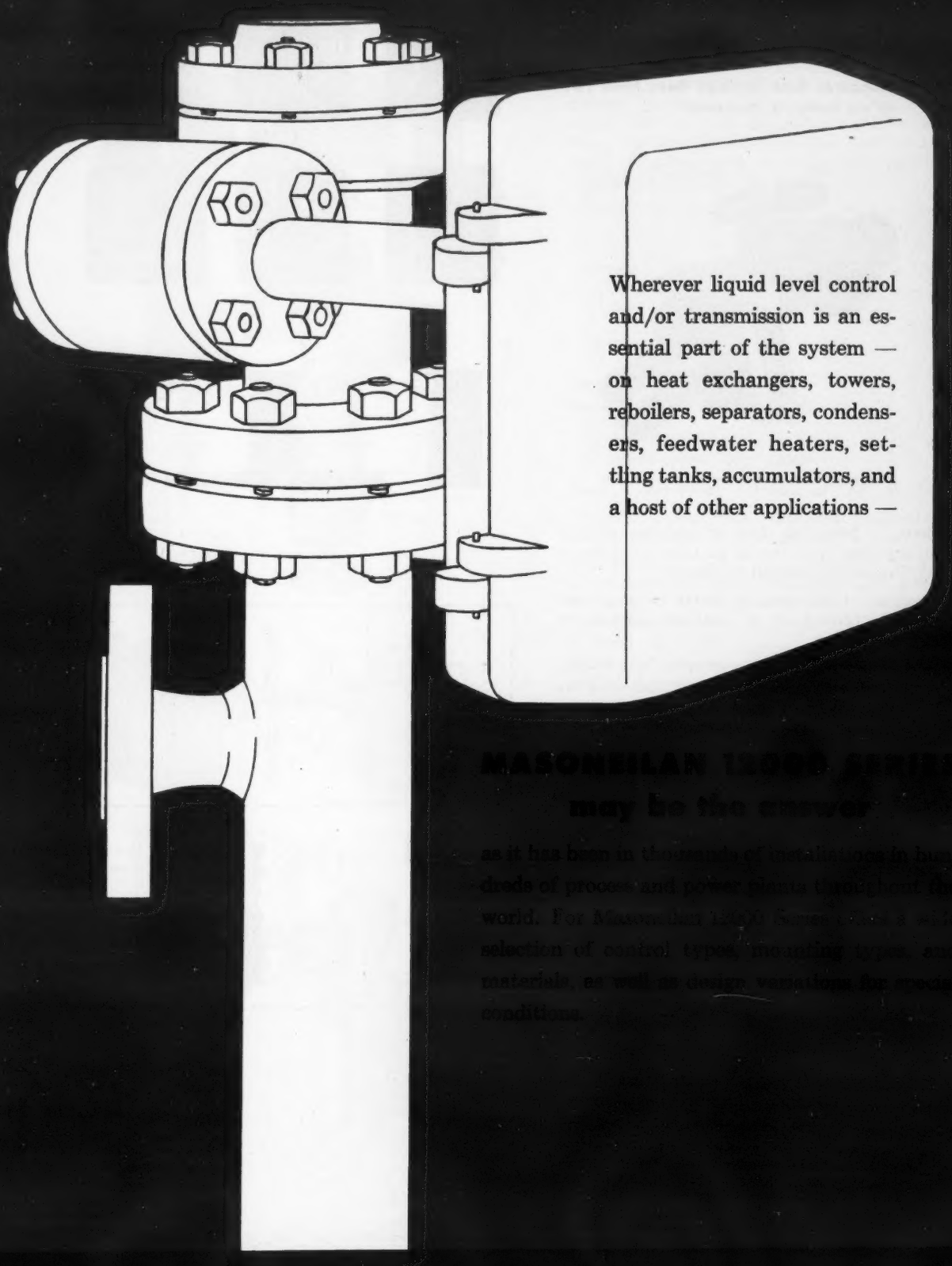


Single unit monitors, records, and controls pH

(pH System is product of Beckman Div., Beckman Instruments, Inc., Dept. CP, Fullerton 1, Calif. . . . or check CP 1204 opposite last page.)

For more information on product at right, specify CP 1205 . . . see information request blank opposite last page.

Name Your Level Problem



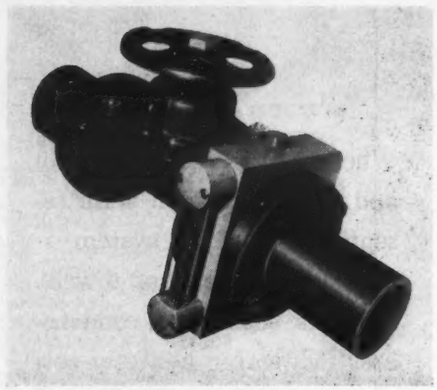
Wherever liquid level control and/or transmission is an essential part of the system — on heat exchangers, towers, reboilers, separators, condensers, feedwater heaters, settling tanks, accumulators, and a host of other applications —

MASONEILAN 12000 SERIES may be the answer

as it has been in thousands of installations in hundreds of process and power plants throughout the world. For Masoneilan 12000 Series offers a wide selection of control types, mounting types, and materials, as well as design variations for special conditions.

Uses orifice with by-pass to indicate flow

Measures flow through lines from two to six inches in diameter

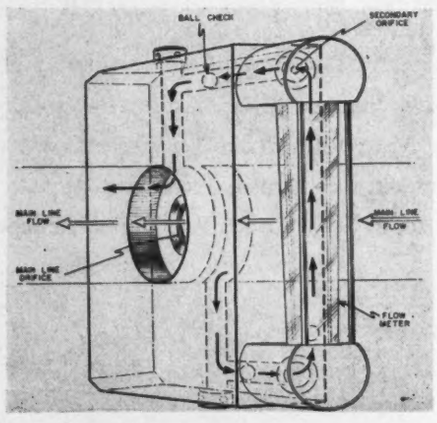


Flow meter must be mounted in horizontal line

Uses: Measuring flows of chlorine solution through lines from two to six inches in diameter for control of biological organisms.

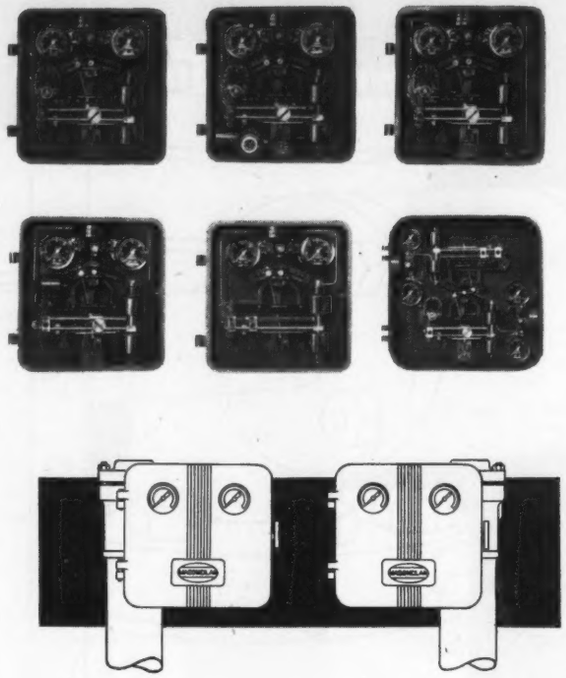
Features: Instrument is simple in design and ruggedly constructed of materials resistant to chlorine solution.

Description: Indicator uses orifice with by-pass line to indicate flow of chlorine solution. Unit has ten-to-one range and easily-read linear percentage scale. Unit is mounted directly in horizontal pipeline as metering tube must always be vertical. Most of main flow passes through orifice, but



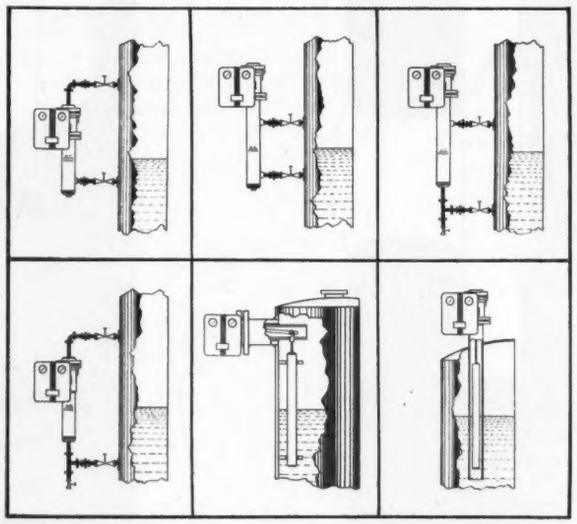
Uses orifice with by-pass line to measure chlorine-solution flow

There's a Masoneilan Level Controller



Proportional, proportional-reset, differential gap and pneumatic set controllers; pneumatic transmitters; duplex instruments with required combinations of these types — all are standard models. Standard output ranges 3-15 or 6-30 psi.

The instrument may be mounted to right or left of the displacer chamber — and may readily be changed in the field without special tools. Displacer chambers are available with mid-flange, if desired for field orientation; or with integral construction.



Displacer chambers may have screwed or flanged connections located at top-and-bottom; top-and-side; side-and-bottom; or side only. Internal displacer types for flanged mounting on top or side of vessel provide for special vessel requirements.

MATERIAL SELECTION

Displacers may be Type 304, Type 316 stainless steel; Monel; Hastelloy B or C; Durimet 20; copper; or solid Teflon.

Chambers may be iron; carbon steel; carbon moly; chrome moly; stainless steel; Monel; or other castable and/or weldable alloys.

Torque Tubes may be Inconel; phosphor bronze; Type 316 stainless steel; or Monel.

for Practically every Application

Standard displacers are cylindrical, having a constant volume regardless of level range. The shape may be varied for special applications provided that volume remains within design limits of the instrument. Step-type displacers with two or more steps may be useful for alarm or similar service.

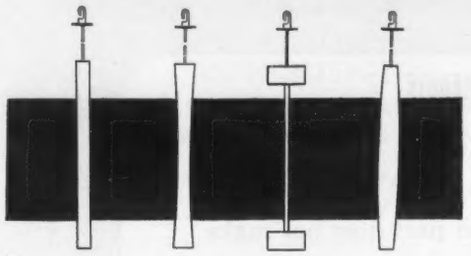
Ratings available range from Class 125 iron to 2500 lb ASA steel — depending on mounting type.

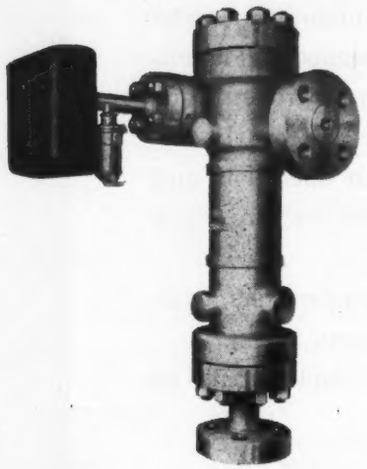
Air-fin torque tube housing extensions available for high temperature; displacer chamber extensions for low temperature. Operating ranges between minus 400°F and plus 850°F.

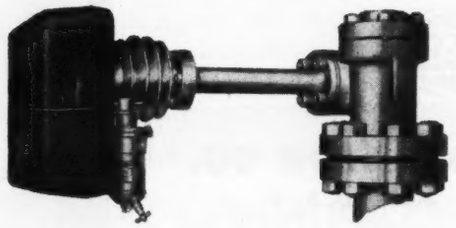
LEVEL RANGES

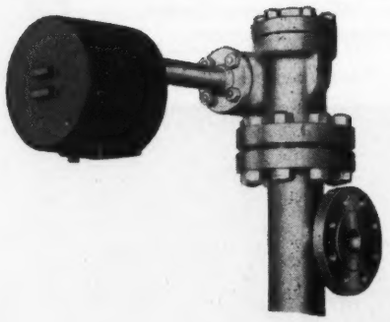
Standard ranges are 14″, 32″, 48″, 60″, 72″, 84″, 96″, 108″ and 120″; special ranges available.

A suitable electronic transmitter may be substituted for the standard instrument if desired.









When inquiring check CP 1205 opposite last page

small proportion flows through by-pass line in housing, up through glass metering tube, and through another channel in housing to an opening on the down-stream side of the orifice. Scale reading opposite glass-ball float in metering tube — a variable-area meter — directly indicates main line flow rate. Pressure drop of 50 inches water is created at maximum flow. Tube or flow can be removed for cleaning by taking out four screws which hold the tube end-fitting to the housing. Main line flow need not be shut down because ball check valves stop flow through the by-pass line with removal of the flow indicator.

(Figure 1070 Chlorine Solution Flow Indicator is a product of Fisher & Porter Co., Dept. CP, 48 Jacksonville Rd., Hatboro, Pa. . . . or for more information check CP 1206 on handy form opposite last page.)

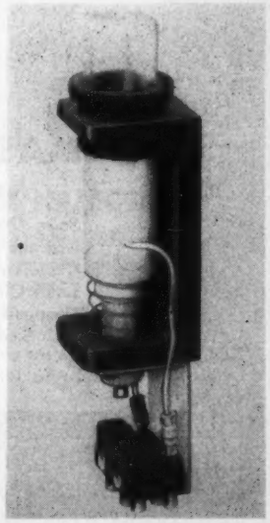
Small switch has light in push-button . . .

removable translucent pushbuttons can be red, frosted white, clear plastic

Uses: For panel indication of "off" or "on".

Features: Removable translucent pushbuttons, red, frosed white, clear plastic, can be used.

Description: Switch uses single-pole, double-throw, subminiature basic switching unit rated at 125 or 250v AC, 5 amperes. Switch is provided with a socket inside of head of push-button for single-contact miniature bayonet lamp. Incandescent bulbs can be used on 6 to 28 v DC circuit and neon bulbs can be used, with a resistor, on 150v circuits. Switch can be panel mounted in groups using one inch centers. Switch requires a low-operating force and has a high pre-travel (movement of button before contacts snap over).



Pushbutton can be red, frosted white or clear plastic

(Switch 31PB1 is a product of Micro Switch Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Freeport, Ill. . . . or for more information check CP 1207 on handy form opposite last page.)

Look at the Whole Picture

ALL HIGH Quality Coefficient PRODUCTS

One well-designed and manufactured part does not make a level controller that will provide accurate performance over a long period with a minimum of maintenance and operation delays. *Every* part must be designed and manufactured so that all combine to make a controller which incorporates wise selection of materials for the intended service; skillful design for accurate operation; and experience which forestalls the difficulties you are likely to encounter in the field.

So in selecting level controllers and transmitters, evaluate *all* the quality factors — and compare.

Take the first step by writing for complete data on Masoneilan 12000 Series.

MASONEILAN

MASON-NEILAN REGULATOR CO.

1203 ADAMS STREET, BOSTON 24, MASS., U. S. A.

Sales Offices or Distributors in the Following Cities: New York • Syracuse Chicago • St. Louis • Tulsa • Philadelphia • Houston • Pittsburgh • Atlanta Cleveland • Cincinnati • Detroit • San Francisco • Boise • Louisville • Salt Lake City • El Paso • Albuquerque • Odessa • Charlotte • Los Angeles Corpus Christi • Denver • Appleton • Birmingham • New Orleans • Dallas Seattle. Mason-Neilan Regulator Co., Ltd., Montreal and Toronto

When inquiring check CP 1205 opposite last page

Gives paper specifications for special charts

Compilation of bulletins has been made which give paper specifications for instrument recording charts. Including 16 different bulletins, information is designed for instrument men requiring "special" recording charts. Subjects include chart paper, special recording papers including heat-sensitive and electro-sensitive papers, roll chart core sizes, roll chart punch sizes.

"Technical Notes" is issued by Technical Charts, Inc., Dept. CP, 189 Van Rensselaer St., Buffalo 10, N. Y. When inquiring specify CP 1208 on handy form opposite last page.

Uses null-balance measurements to indicate temperatures . . .

electronic manual-balance indicator reads temperature differences directly to 0.02°F

Uses: For heat exchangers, distillation columns, wet and dry bulb humidity measurements, freezing point determinations, industrial temperature measurements using thermocouples or resistance bulbs.

Temperature is read when galvanometer reads zero

Features: Instrument is designed so highest sensitivity is at balancing point; precise null adjustments can be made with protection from extreme unbalance.

Description: Meter registers zero when correct temperature is on dial. Temperature differences small as 0.02°F are electronically amplified to unbalance galvanometer. Sensitivity of instrument

is 0.05% of full scale with accuracy of ±0.25% of full scale.

Slidewire and dial are adjusted to new temperature reading by zeroing meter. Instrument can be connected through connector panels, toggle or rotary switches. Enclosed slidewire is protected from dust and electrical interference. Case is gasketed to protect instrument from dust, smoke, fumes, moisture.

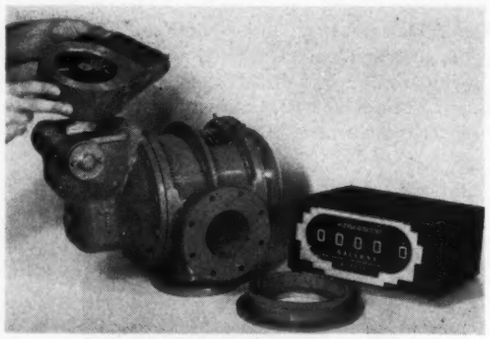
(Thermo electronic manual-balance indicator is product of Thermo Electric Co., Inc., Dept. CP, Saddle River Township, Rochelle Park Post Office, N. J. . . . or check CP 1209 opposite last page.)

Closes electrical circuit proportional to units counted by meter . . .

impulse-contactor will close circuit (or open it) with every gallon or tenth of a gallon

Uses: Actuating electrically-operated devices, as pumps, counters, totalizers, recorders, sampling devices, according to volume-units measured by meter.

Features: Contactor will open or close an electrical circuit to maximum of 1500 times/min.



Contactor, at left, attaches to meter. Register is placed on top

Description: Instrument consists of a cast aluminum housing containing switch-operated mechanism and explosion-proof switch which is externally attached. Impulse-contactor causes the closing (or opening) of an electrical circuit at intervals proportional to number of units measured by the meter. As: one closing for every gallon, or for every tenth of a gallon. Contactor is designed for attachment to manufacturer's liquid meters.

(Electrical impulse contactor is a product of Meter and Valve Div., Rockwell Mfg. Co., Dept. CP, 400 N. Lexington Ave., Pittsburgh 8, Pa. . . . or check CP 1210 opposite last page.)

GUARANTEED

CONCLUSION:

"Meets the U. S. P. 14 requirements for distilled water, sterile distilled water and water for injection"

**INDEPENDENT LABORATORY*

July 21, 1955

Precision Scientific Company — No. 44425
3737 West Cortland Street — U.S.P. - 14
Chicago 47, Illinois

Gentlemen:

REPORT

SUBJECT: Examination of water produced in our laboratories by distilling Chicago city water with your Precision "Streamliner" Laboratory Water Still.

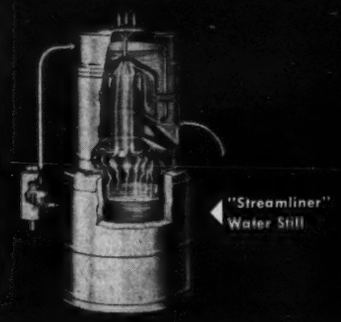
Chemical Examination	Parts per million
Total solids	1.00
Silica - SiO_2	0.066
Iron and alumina - Fe_2O_3 & Al_2O_3	Trace
Calcium - Ca.....	0.07
Magnesium - Mg.....	No weighable trace
Sodium and Potassium.....	Less than 0.10
Sulfate.....	No weighable trace
Chloride.....	Less than 0.10
Alkalinity as carbonate..	Less than 0.10

This water passes the following U. S. P. tests listed under Distilled Water and therefore meets this specification in its entirety:

Appearance	Ammonia
Color	Calcium
Odor	Carbon Dioxide
Taste	Heavy Metals
Reaction	Total solids (see also above)
Chloride	Pyrogen-free
Sulfate	

Conductivity Test: 3.5 Micromhos

**NAME SUPPLIED UPON REQUEST*



SINGLE DISTILLATION PRODUCES WATER FIT FOR INJECTION

This independent laboratory report on the distillate of a Precision "Streamliner" Water Still clearly shows the results to be expected from the entire line of Precision Water Stills.

PERFORMANCE OVER THE YEARS

Experience *over the years* has proved that water stills by Precision produce a purer distillate in more volume with less attention at lower cost. In operation, they meet *all* U.S.P. standards, produce pyrogen-free water and reduce total solids to 1 part per million!

FROM A TRICKLE TO A TORRENT

All Precision models are *hard water* stills. Your capacity requirements from 100 to ½ (gallons per hour) CAN BE DELIVERED FROM STOCK IN MOST MODELS.

A new brochure covering all models of Precision Water Stills, Storage Tanks and Accessories is available. Why not write for it today?

Precision Scientific Company

3747 WEST CORTLAND STREET • CHICAGO 47

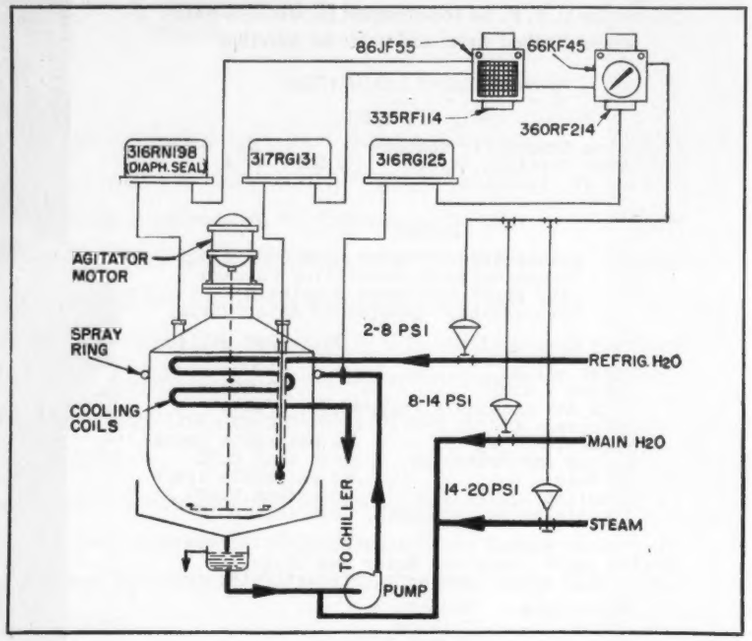
When inquiring check CP 1211 opposite last page

REACTOR CONTROL

One of a series of basic instrumentation recommendations for the unit operations

GEORGE E. HOWARD, Manager
Application Engineering Dept.

"Taylor pioneered in the development of control systems for chemical reactors. This recommendation is the result of many years of experience of our application engineers in handling problems inherent in this type of reactor. Data sheets on this and other reactor problems are available on request."



PROBLEM

To achieve maximum yield of specification product in the shortest possible time, with minimum cost. Optimum reaction rate is dependent on precise temperature control. This is difficult because of the lags inherent in the equipment. The principal lags are: the poor transfer of heat from product to the measuring element through a heavy protective well; and slow heat transfer into or out of the product through the vessel wall.

SOLUTION

The first lag problem is compensated for by the use of SPEED-ACT* (derivative) response in the measuring system of the TRANSAIRE* Temperature Transmitter. This permits rapid and accurate sensing of any temperature changes as the reaction proceeds.

Capitalizing on the dynamic accuracy of the TRANSAIRE Transmitter, the TRI-ACT* Controller, with its unique circuit arrangement, makes possible fast "come-up" without overshoot. Yet, it maintains the control point within extremely narrow limits regardless of process upsets. A vital contribution to this precision control is the cascade system which keeps spray-ring water temperature at the value required to accurately maintain product temperature, thus taking care of lag through the vessel wall.

The TRANSET* miniature receiver permits a continuous record of product temperature with the added convenience of auto-manual switching and remote set point change.

BENEFITS

1. Faster, safer "come-up" time.
2. Danger of wild reaction eliminated.
3. Maximum yield of specification product in shortest possible time.
4. Duplication of quality, batch after batch.
5. No loss of raw material due to over or under reaction.
6. Economical production through conservation of heating and cooling media.

• • •

Reaction problems that might well benefit from such a control system include those involved in the production of Polystyrene, Plastics, Synthetic Rubbers, Synthetic Resins, Antibiotics, Intermediates.

Send for Data Sheet No. 9 covering in greater detail the recommended instrumentation for this and other types of reactors. Watch this magazine for future Taylor advertisements dealing in a similar manner with other unit processes. In the meantime, don't forget that Taylor Field Engineers have had intensive training and many years of experience in solving all kinds of instrumentation problems. They are ready, willing and able to serve you. Taylor Instrument Companies, Rochester, N.Y.; Toronto, Canada.

*Trade Mark

Taylor Instruments MEAN ACCURACY FIRST

When inquiring check CP 1212 opposite last page

Illustrates meters for lines 2 to 36" and larger

Two-color twelve-page bulletin illustrates a complete line of direct-reading, propeller-style instruments for metering water and other liquids. Meters are designed for measuring flow of clear liquids in lines of 2 to 36 inches and larger in diameter. Bulletin includes pressure loss charts and typical accuracy curves.

Bul 380-K4A is issued by Builders-Providence, Inc., Division of B-I-F Industries, Inc., Dept. CP, 345 Harris Ave., Providence, R. I. When inquiring specify CP 1213 on handy form opposite last page.

Tests adequacy of line power for motor starting current before installation . . .

checks ability of single-phase 115v AC line to furnish 13 to 50 amp

Uses: Furnishes pre-installation test of line quality before placing motors or other electrical equipment on line.

Features: Meter is completely self-contained and requires no outside power except connection to power line tested.

Description: Variable control reads in locked-rotor current from 13 to 50 amp. Instrument has 20-ohm resistance as load across power line. Reduced line voltage is applied to primary winding of auto-transformer. Secondary voltage is applied

Tester reads locked-rotor current from 13 to 50 amp

across 40-ohm rheostat, 100-ohm potentiometer and 33-ohm resistor in series. Meter reads sum of reduced line voltage and tapped voltage from transformer. When meter reads same amount with test switch either open or closed, tapped voltage is equal to line drop due to the 20-ohm load. Power line is adequate for current indicated by control knob. Meter indication will decrease if line is not adequate for proposed load.

Unit is 3 11/16 x 5½ x 2½". Weight is 2¼ lb. Line cord is five ft long.

(Line-o-meter is product of Simpson Electric Company Division, American Gage and Machine Co., Dept. CP, 5200 W. Kinzie St., Chicago 44, Ill. . . . or check CP 1214 opposite last page.)

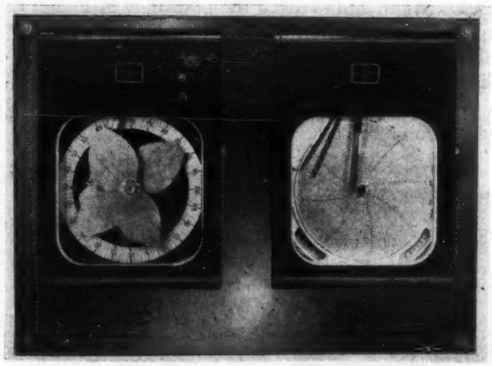
Operates up to eight switches and controls two variables of process cycle . . .

temperature, humidity, pressure, or vacuum set by aluminum cams

Uses: Operating valves, switches, dampers, starting and stopping motors, pumps, blowers in plastic molding, rubber vulcanizing, process control.

Features: Cycle controller times and programs up to eight operations and at same time controls two process variables.

Description: Instrument is two units which can be mounted side by side or one above another to meet space requirements. Process variables are controlled by aluminum cams cut to proper shape. Each

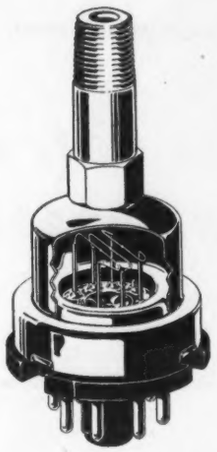


Two aluminum cams at left control process variables

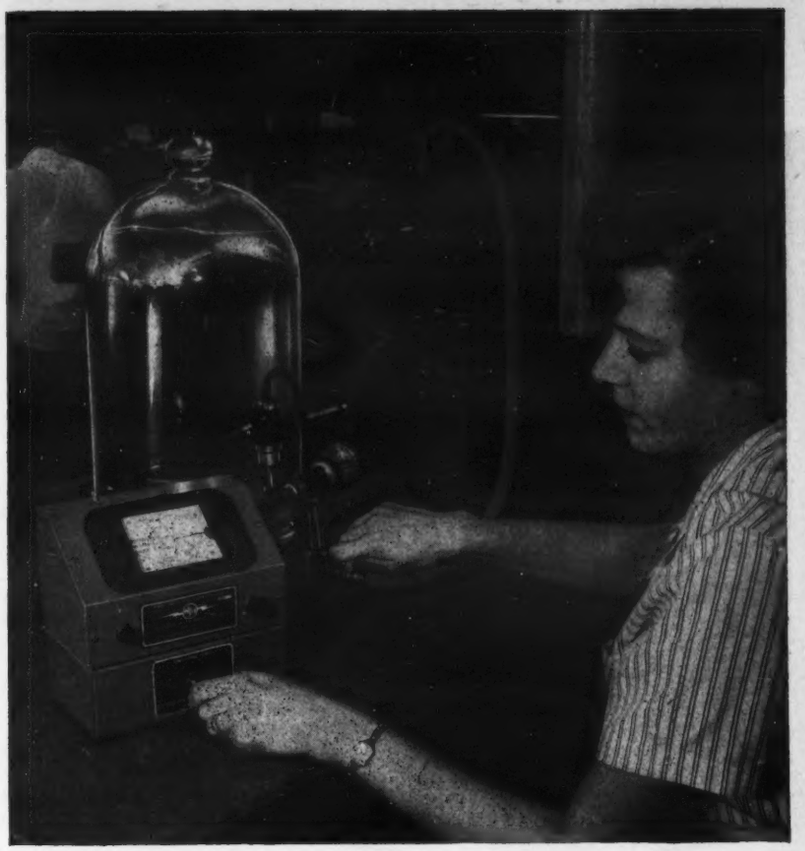
of the two cams is individually cut; they can be locked together in any desired time relationship on single hub. Cams can be changed rapidly, altering program to meet varying requirements. Temperature can be controlled through one cycle while pressure is going through another cycle independently but synchronized with temperature. At same time, valves or switches can be opened or closed; motors, pumps, blowers can be automatically timed by the cycle controller.

Instrument can be used in either electrical or pneumatic systems. Electrical models are on-off or proportional. Pneumatic models are proportional, reset, or derivative.

(Cycle controller is product of The Bristol Company, Dept. CP, 127 Bristol Rd., Waterbury, Conn. . . . or check CP 1215 opposite last page.)



SHORT WELDED NOBLE METAL ELEMENTS
withstand the vibration and shocks that ruin long wired gauge tubes. Elements are direct heated, reach operating temperature in less than one second.



New Hastings Vacuum Gauge Lasts 10 Times Longer

Short, direct heated elements can't be damaged by vibration or pressure changes

Here is a vacuum gauge that provides laboratory-type accuracy under industrial production conditions. Simple to operate. Dependable. Highly stable. Single knob control.

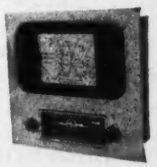
Standard instrument case model, complete with gauge tube.

ONLY $100.00

Available with switching attachment and matched gauge tubes for master station indication of up to 29 points. Calibration accuracy independent of lead length or ambient temperature.

For further information wire HICO Instrument Division, Hastings Instrument Company, Hampton 10, Virginia.

ALL HASTINGS VACUUM GAUGES
provide highest accuracy through the 1-1000 micron range. Direct reading logarithmic scale expands lower range indications. Panel mounted and instrument case models available with matched gauge tubes, switching attachment, strip chart recorder.



HASTINGS VACUUM CONTROLLER
automatically maintains vacuum systems in any desired range from 1-1000 microns with highest accuracy. Operates pump, alarm system, valves, etc. Response time ½ second. Internal voltage regulation.

HASTINGS INSTRUMENT COMPANY, INC.
Main Office and Laboratories • HAMPTON 10, VIRGINIA

When inquiring check CP 1216 opposite last page

STOP Corrosion with...

Van-Cor

PLASTIC PIPE, FITTINGS AND FABRICATIONS

★ Both Chemically Resistant and Impact Resistant Types

★ Half the Weight of Aluminum, with High Tensile Strength

★ Readily Formed, Machined, Drawn, Molded or Welded

AVAILABLE FORMS

SHEETS... 1/32" through 1". PIPE... 1/2" through 8" diameter (10 or 20 ft. lengths). ROUND BARS... 3/8" through 5" diameter (10 ft. lengths). WELDING ROD... 1/8" and 5/32" diameter.

TYPICAL APPLICATIONS

A rigid non-plasticized polyvinyl chloride, Van-Cor is fabricated into such products as: Ducts, Hoods, Chemical Tanks, Tank Liners, Plating Racks, Fume Stacks and Piping.

WRITE FOR ILLUSTRATED BULLETIN, SPECIFICATIONS, AND NAME OF NEAREST DISTRIBUTOR

INDUSTRIAL DIVISION OF
COLONIAL PLASTICS MFG. CO.

SUBSIDIARY OF THE VAN DORN IRON WORKS CO.
2685 EAST 79th STREET • CLEVELAND 4, OHIO

When inquiring check CP 1217 opposite last page

At Victor Chemical's Chicago Heights plant, stainless steel fan —

handles hot, corrosive vapors from phosphoric acid unit

blower is key part of production unit, has stood up well for more than 2 1/2 years

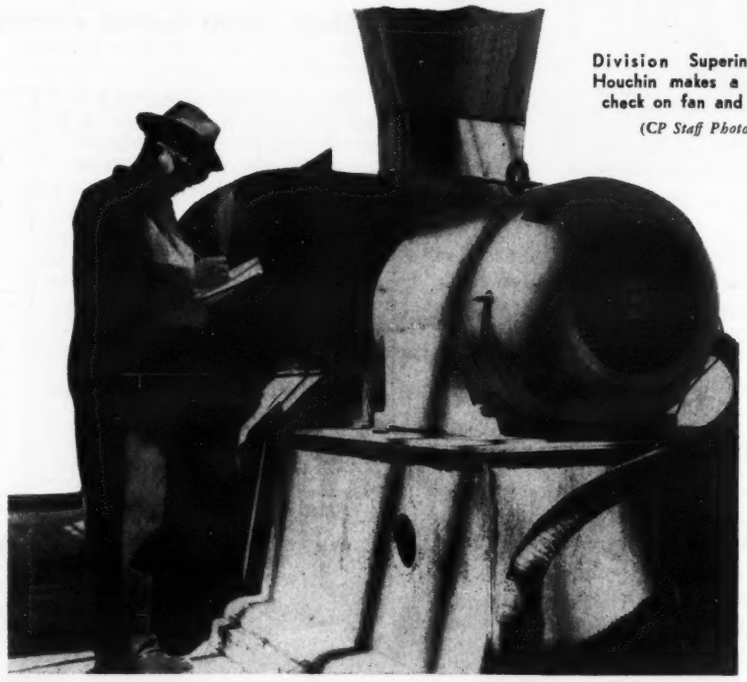
By **F. E. McELROY**, Assistant Editor
with **O. C. HOUCHIN**, Division Superintendent
Victor Chemical Works, Chicago Heights, Ill.

FAN pulling the vacuum on one of Victor Chemical's phosphoric acid production units is subject to an atmosphere that is not only inherently corrosive, but is also at elevated temperatures. Fan is key to whole production unit: burning of white phosphorus and adsorption of the resulting P_2O_5 by water is all carried out under reduced pressure.

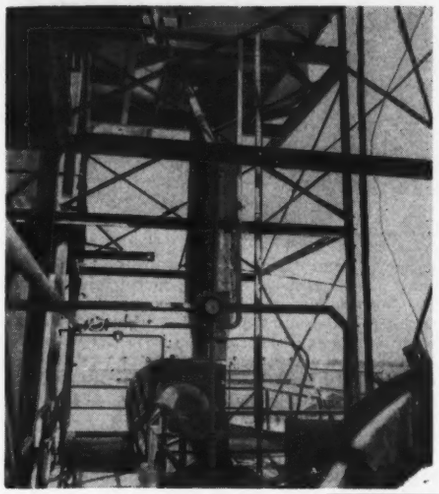
Gas that still contains small quantities of P_2O_5 emerges from acid adsorber and enters a mixing box before the fan. Gas stream is hit with a spray of weak phosphoric acid that impinges on center of fan. Thus the fan must take punishment from the gases as well as from the dilute acid.

Type 316 stainless steel was specified for the blower. Its design was such that the liquid phase would be knocked out of the gas stream and fall downward to be recirculated to adsorber and then the liquid-free gas blown up the stack.

Some of the fan fabrication details are interesting. No rivets are used on the wheel shell to gain increased strength and to avoid the possibility of undue corrosion resulting from high internal stresses and carbide precipitation caused by hot riveting. Blades of the blower are welded to hub plate on both sides and to the rim. All interior joints are welded and the welds ground smooth.



Division Superintendent Houchin makes a routine check on fan and motor
(CP Staff Photo)



CP Staff Photo

Fan (center, below) pulls vacuum on system, sends acid-free gases to stack

Fan pulls 13,000 cfm, and is powered by a 100 hp GE induction motor, totally enclosed. This motor is rated at 1780 rpm and powers the fan through a direct drive. The fan pulls a 13½ inch vacuum on exit side of adsorber. Fan rotor is 41 inches in diameter.

Fan has given very satisfactory performance since it was installed in January 1953. Service records indicate that little, if any, corrosion of the parent metal adjacent to the welds has occurred as a result of carbide precipitation. Only normal maintenance has been required.

(Fan is a product of American Blower Corp., Dept. CP, Detroit 32, Mich. . . . or for more information check CP 1218 on handy form opposite last page.)

Acids, bases, salts, and oils resisted by plastic-coated wire rope . . .

flexibility of cable not adversely affected by plastic coating

Most acids, bases, salts, oils, and greases are resisted by plastic-coated wire rope. Exceptions are hydrofluoric acid and methyl ethyl ketone. Product withstands sunlight, oxidation, and provides excellent color stability. Flexibility of the wire rope is not adversely affected by the plastic coating.

(Plastic-coated wire rope is a product of Macwhyte Company, Dept. CP, 2936 14th Ave., Kenosha, Wis. Check CP 1219 opposite last page.)

Insul-Mastic

PROTECTIVE COATINGS

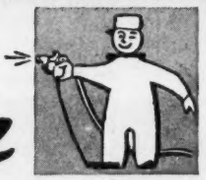
. . . the tough skin of industry

We can show you INSUL-MASTIC Coatings that have been preventing corrosion for 10, 12 and 15 years. Many of these applications are in industrial plants where corrosive fumes and vapors have been known to eat through other coatings within a very short time.

These INSUL-MASTIC Coatings have lasted through these many years without need of replacement.

This is an exceptional record. It should be considered seriously when you specify Protective Coatings.

It pays to think *first* of the coatings that *last* . . . INSUL-MASTIC.



Insul-Mastic

think first of the coatings that last!

Representatives in Principal Cities

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When inquiring check CP 1220 opposite last page

BENNETT

IS MY NAME...

I'VE GOT THE FACTS ON HI-BAKE PAILS

There's a world of difference between Bennett Protected and ordinary hi-bake lined pails. *It's the way they are made that counts.*

PAIL EARS . . . Bennett projection welded ears eliminate rivet crevices, a common point of failure in ordinary hi-bake pails.

SIDE SEAM . . . Bennett pails have the smoothest side seam in the industry. Free from heavy overlap and weld spatter.

BOTTOM CHIME . . . Bennett Hi-Bake Linings go all the way *through* the bottom seam or chime.

BAKING CONTROL . . . The crux of all hi-bake linings. Bennett has the latest type ovens with tolerance limits that insure a perfect product.

THOROUGH INSPECTION . . . Bennett gives your product double protection . . .

FIRST with carefully inspected, correctly applied hi-bake linings.

SECOND with *pretested* containers and superior workmanship, the result of over 40 years of experience in steel container manufacture.

Call Bennett today for help on the type of hi-bake lined pail best for your specific product. We supply lined pails for your own tests without obligation.

BENNETT INDUSTRIES

INCORPORATED

Peotone, Illinois

40 MILES SOUTH OF CHICAGO LOOP ON ROUTE U. S. 54

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BENNETT PAILS ARE DISTRIBUTED BY

Chicago, Fred A. Jensen; **Atlanta,** Geo. E. Missbach & Co.; **Buffalo,** R. C. Gerber; **Cincinnati,** Paul Wiemer Co.; **Cleveland,** Donald McKay Smith Co.; **Denver,** Douw Fonda Co.; **Des Moines,** Frank Seitz Sales Co.; **Detroit,** A. E. Fleming Co.; **Indianapolis,** L. S. Carr; **Kansas City,** Ack Sales Co.; **Los Angeles,** A. J. Lynch & Co.; **Memphis,** The Lilly Co.; **Milwaukee,** R. L. Ferguson; **Minneapolis,** Willard N. Swanson Co.; **New York City,** Murray Oil Products Co.; **Omaha,** French Brokerage Co.; **Pittsburgh,** E. E. Zimmerman Co.; **Portland,** Cordano Chemical Co.; **Richmond,** F. V. Gunn & Co.; **St. Louis,** American Metal Barrel Co.; **San Francisco,** A. J. Lynch & Co.; **Seattle,** Carl F. Miller & Co.; **Spokane,** Pearson & Smith; **Boston,** The Truesdale Co.

When inquiring check CP 1221 opposite last page

Books contain technical data on clad steel heads

Two hard-cover books contain technical data on clad steel heads, as well as on carbon and alloy spun heads. Formula for estimating sizes, tolerances, and data on machining are included.

Two books on clad steel heads and carbon and alloy spun heads can be obtained for $3.00 each from Lukens Steel Company, Dept. CP, 1949 Gillen St., Coatsville, Pa.

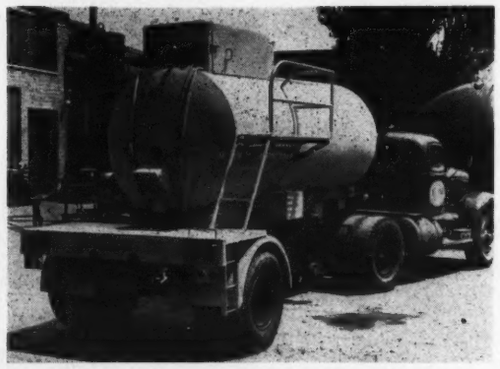
Variety of corrosive liquids delivered with glassed-steel tank trailer . . .

several noteworthy safety features included in design of unit

Uses: Tank trailer permits ready-for-use delivery of a wide variety of corrosive liquids.

Features: The 2200-gallon unit handles all acids except hydrofluoric, and alkalis to pH 12.

Description: Glassed-steel tank trailer includes several noteworthy safety features in the design. A bottom outlet for tank wash-out is conveniently located near the rear platform. Outlet is sealed with a beveled Teflon plug with tantalum handle, then capped with a bolted steel flange. Protective shield locks the outlet assembly.



Safety engineered tank trailer of glassed-steel

A sliding hood at the top of tank, which also locks when not in use, houses the manhole and vent. Tank is filled and emptied through a dip pipe located in a manhole opening. The dip pipe, glassed on both sides and tantalum-tipped, extends into a sump at the bottom of the tank to insure removal of all liquid. Pressure relief valve is contained in tank vent.

(Glassed-steel tank trailer is product of the Pfaudler Co., Dept. CP, 1000 West Ave., Rochester 3, N.Y. . . . or check CP 1222 opposite last page.)

Corrosion problems solved with I-R Chemical Pumps built of IRCAMET

Ingersoll-Rand chemical pumps are built to stand up under the continuous handling of corrosive and abrasive liquids.

Ircamet—a special high nickel-chromium-molybdenum alloy steel—has exceptional ability to resist the corrosive action of a wide variety of acids and alkalis. Other materials are available for special conditions.

What's more, I-R chemical pumps are positively protected against leakage by the *Leakollector* stuffing box gland and the *Cameron Shaft Seal.*

Your nearest I-R engineer will be glad to explain the many cost-saving features of these chemical pumps. Ask him for your copy of Bulletin No. 7095-A.

Ingersoll-Rand 10-206 Cameron Pump Division 11 Broadway, New York 4, N. Y.

PUMPS • CONDENSERS • TURBO-BLOWERS • COMPRESSORS • AIR & ELECTRIC TOOLS • ROCK DRILLS

When inquiring check CP 1223 opposite last page

Account For Corrosive Liquids

ALCOHOLS, VEGETABLE OILS, DEIONIZED WATER, ETC.,

with

Rockwell "316" Stainless Steel Meters

Cut-away view

Be Sure of Your End Product

Want the finest degree of *quality control* in your formulations? Need accurate *cost controls* over liquid ingredients? Is *inventory* a problem? Are *losses* eating into your profits? Then turn to a basic accounting tool—*Rockwell liquid meters.* Get the accurate metered records you need to operate efficiently. Available in a wide variety of types, materials and sizes to suit every requirement. Our bulletins tell all. Write today.

YOU CAN RELY ON ROCKWELL

ROCKWELL MANUFACTURING COMPANY

DEPT. 106-K, PITTSBURGH 8, PA.

When inquiring check CP 1224 opposite last page

Plastic dip pipe resists damage, corrosion . . .

combines laminated fluorocarbon resins and glass fabric

Serving the need for non-fragile, non-corrosive conduit in tanks, reactors, and other vessels, recently-developed dip pipes are an application of company's Fluoroflex-T laminated pipe. Made from laminated fluorocarbon resins and glass fabric, these dip pipes are complete with flanges, packing glands and other necessary accessories.

Important advantages of these assemblies is their high degree of chemical inertness to practically all corrosive liquids, and their ability to take rough handling or thermal shock. They withstand temperatures from −100 to 500°F.

A typical application of this plastic dip pipe is shown in accompanying photo: a Bloomfield plant employe of Bakelite Corp. (Div. of UCC) holds an assembly prior to installing it in glass-lined still. Process involved requires dip pipe to be completely resistant to highly corrosive substances as well as fracture-proof for protection of the still.

(Plastic dip pipe is a product of Resistoflex Corporation, Dept. CP, 39 Plansoen St., Belleville 9, N.J. . . . or for more information check CP 1225 on handy form opposite last page.)

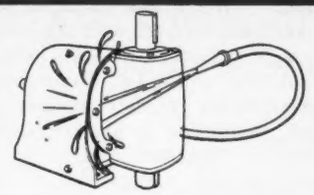
For more information on product at right, specify CP 1226 . . . see information request blank opposite last page.

The versatile, STRAIGHT LINE—

ALL-STEEL FALK SPEED REDUCER

(Concentric Type)

High and low speed shafts suitable for V-belt, gear or chain as well as coupling connections



The Type "C" Speed Reducer has these "In-built" Factors:

Sealed Housings. Dual closures and one-way vents keep oil in, dust and moisture out. Units are splash-proof, leakproof, dust-proof.

Positive Lubrication. Large sump capacity . . . oil-tight construction assures clean lubricant . . . direct dip of revolving elements provides positive lubrication at all speeds.

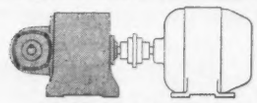
Precision Gearing. Heat treated alloy steel, precision cut and shaved helical gearing throughout . . . quiet-operating crown shaved pinions . . . taper bored gears for easy ratio changes.

Wide Speed Range. Selective ratio combinations provide output speeds from 1.5 rpm to 1430 rpm with stock gears.

All-steel Housings. Unbreakable, strong, rigid. Generous overhung load capacities provided by wide bearing spans, large shafts and bearings.

Streamlined inside and outside. Smooth, clean surfaces; machine welded construction conforms to NEMA motor frames.

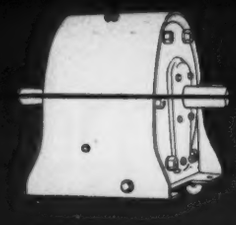
A FEW TYPICAL DRIVES FOR "C" AND "CB" UNITS

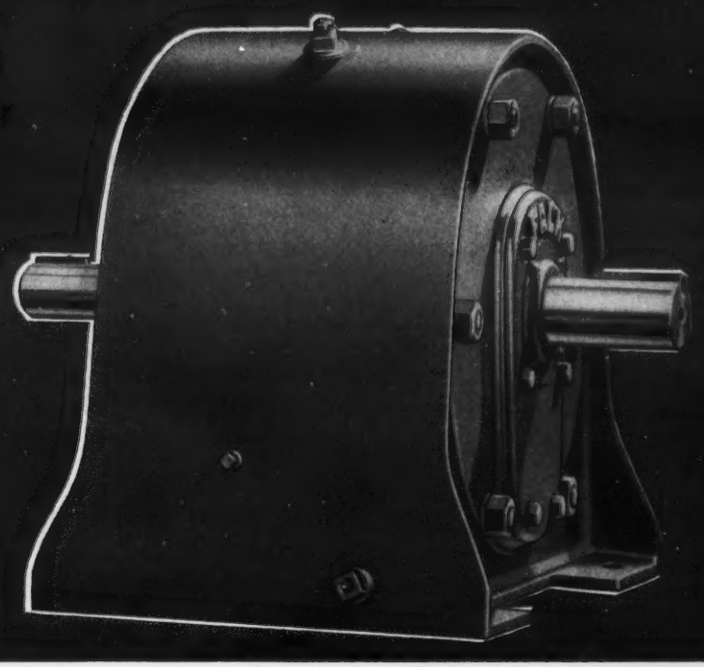


COUPLING TO "CB" UNIT

V-BELT TO "C" UNIT

CHAIN TO "CB" UNIT





The ideal type for Turbine, Engine or Special Motor

Here is an exceptionally versatile member of the famous FALK line of reduction units. The Type "C" Straight Line Speed Reducer is an all-steel concentric shaft unit rated in accordance with AGMA standards. It is structurally similar to the universally popular FALK Motoreducer, and offers many special application advantages.

It can be driven by motor, turbine or engine with direct coupling connection—or through a V-belt or chain drive. It lends itself effectively to hydraulic coupling, brake-wheel or overload protective coupling, multi-speed transmission, or to variable speed drives—without modification. Units can include self-contained backstop if desired. Ratio can be modified with easily installed stock gears. With modifications, unit can be used as a speed increaser.

These all-steel Straight Line Speed Reducers are *available for prompt delivery* in standard ratios in horizontal and vertical concentric models, also in horizontal and vertical right-angle models; in single, double, triple and quadruple reduction. For full details, write for Bulletin 1104.

FALK ...a good name in industry

THE FALK CORPORATION · 3001 W. Canal St. · Milwaukee 8, Wis.

Look to FLINTKOTE ADHESIVES

for low-cost volume processing

Not only lower costs but better results are often possible in volume bonding, laminating, impregnating and similar operations . . .

When bulk-supplied Flintkote Industrial Adhesives are applied. For instance, in . . .

Rubber and Resin Latex Compounds
You get great versatility in various formulations of rubber and resin bases for use with papers and cloth materials. For adhering, flexibilizing, binding.

Reclaim Rubber Dispersions
Several high test, low cost, nonflammable water base adhesives offering wide range in viscosity, open and setting times. You can also use them to extend higher cost, new rubber latices for manufacturing economy.

Asphaltic Compounds
Emulsions and cutbacks for adhering, saturating or sizing many fibrous products: felts, insulation, fabrics, paper. You can obtain internal or external water resistance. Also asphalts compounded with rubber and asphalts for extending latices.

Rubber-Resin Solvent Cements
Formulations for multi-purpose bonding of rubber, metal, wood, plastics, leather, glass, fabrics to themselves or one another. Designed for various application methods and systems.

Let's discuss the possibilities of these adhesives for *your* processing problems. Our 50 years specialized experience is always at your service.

Ask for technical data sheets.

THE FLINTKOTE COMPANY
Industrial Products Division,
30 Rockefeller Plaza,
New York 20, N. Y.

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LOS ANGELES · NEW ORLEANS · PHILADELPHIA

In Toronto, Ontario: The Flintkote Company of Canada, Ltd.
In London, England: Industrial Asphalts Company, Ltd.

FLINTKOTE *Products for Industry*

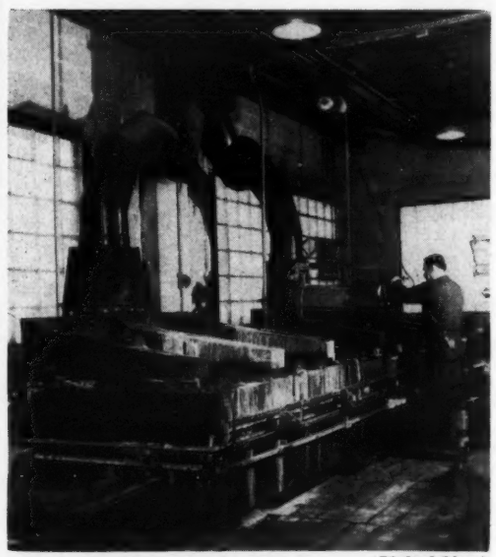
When inquiring check CP 1227 opposite last page

Welded plastic exhaust ducts stand up in hard service

Both corrosive fumes and splash are withstood

Problem: Ventilation duct work for alkali wash and hydrochloric acid pickling baths for parts to be plated with cadmium or zinc had previously been made of iron sheeting coated with acid-resistant paint, at Parker Rust-Proof Company in Cleveland, Ohio. Although this duct work stood up reasonably well, it nevertheless was not entirely satisfactory in this particular application and a new material was desired.

Solution: About two to three years ago, the duct work was replaced with Agilene, high-molecular-weight polyethylene. Each bath has a three-sectional hood and a 14" diameter exhaust stack, connected to an available stainless steel exhaust. Welded construction is used throughout. Capacity of system is 7000-8000 cfm.



(*CP Staff Photo*)

Exhaust ducts have withstood corrosive action of acid and caustic fumes and splash for over two years

Results: Performance of the present duct work has been satisfactory. As can be seen in the photograph, the hot caustic is often carried over onto the ducting, but even this direct contact has caused no corrosion.

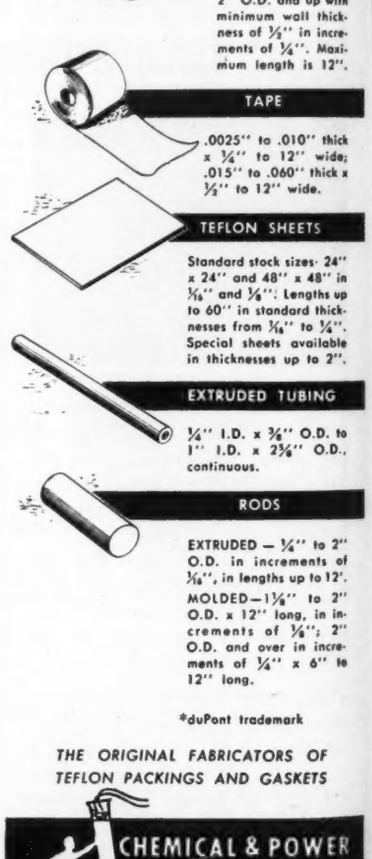
(Agilene ducts are fabricated by American Agile Corp., Dept. CP, PO Box 168, Bedford, Ohio . . . or for more information check CP 1228 on handy form opposite last page.)

CHEMPRO TEFLON STOCK of HIGHEST QUALITY VIRGIN POLYMER

You get better, longer lasting parts from Chempro's Teflon* stock, as it is made from only the finest virgin polymer. Cylinders and tape are made from grade TF-5 polymer. This pure, high quality material assures you a denser, more uniform Teflon for greater service life.

For special applications, Chempro Teflon stock is also available glass-filled (FM-2), glass- and carbon-filled (FM-4) or zirconium-filled (FM-8). Our engineering and laboratory facilities are available to help adapt these materials to your needs.

Write for Bulletin CP554.



MOLDED CYLINDERS
2" O.D. and up with minimum wall thickness of ½" in increments of ¼". Maximum length is 12".

TAPE
.0025" to .010" thick x ¼" to 12" wide; .015" to .060" thick x ½" to 12" wide.

TEFLON SHEETS
Standard stock sizes 24" x 24" and 48" x 48" in 1/16" and ⅛"; Lengths up to 60" in standard thicknesses from 1/16" to ¼". Special sheets available in thicknesses up to 2".

EXTRUDED TUBING
¼" I.D. x ⅜" O.D. to 1" I.D. x 2¾" O.D., continuous.

RODS
EXTRUDED — ¼" to 2" O.D. in increments of 1/16", in lengths up to 12'.
MOLDED—1¼" to 2" O.D. x 12" long, in increments of ⅛"; 2" O.D. and over in increments of ¼" x 6" to 12" long.

*duPont trademark

THE ORIGINAL FABRICATORS OF TEFLON PACKINGS AND GASKETS

CHEMICAL & POWER PRODUCTS, Inc.
9 Broadway, New York 4, N.Y.

When inquiring check CP 1229 opposite last page

Alloys offer corrosion resistance, good mechanical properties . . .

series of cast irons contain chromium, nickel, copper, molybdenum, and aluminum

Group of cast iron alloys offer a combination of high tensile strengths and wear resistance, together with improved corrosion resistance particularly against atmospheric conditions, dilute acids, and other chemicals.

Area of compositions covered by patent on alloys makes it possible to vary the properties within wide limits. Tensile strength of one alloy, No. 2, is 65% higher and the impact strength 90% higher than that of conventional cast iron. This alloy shows good resistance against 5 to 10% sulfuric acid or moist sulfur dioxide.

Patent covers a broad field of the chromium, nickel, copper, molybdenum combination whereby each of these elements is contained in excess of 0.04%, with a maximum of 36%. Aluminum is present in amounts of 0.05 to 1%, silicon from 1.25 to 5.6%, manganese from 0.20 to 3%, remainder being substantially iron. Typical composition represented by alloy No. 2 in the low alloy field is as follows:

Material	Percentage
Chromium	0.90
Nickel	3.47
Copper	0.78
Molybdenum	0.92
Carbon	3.20
Silicon	1.70
Manganese	0.56
Sulfur	0.10
Phosphorus	0.28
Aluminum	0.05
Iron	Rem

(Rezistan Iron alloys are a development of Uniworld Research Corp. of America, Dept. CP, 1302 Ontario St., Cleveland 13, Ohio . . . or for more information check CP 1230 on handy form opposite last page.)

Catalyst in epoxy coatings provides air-dry system that is durable

Epoxy resin coatings, based upon the use of catalysts, provide durable finish similar to a high-temperature baked-on coating. This permits coating of items too large or otherwise impractical to bake, such as chemical process equipment, water towers, and tanks. Coatings are also excellent for floors subject to corrosive spillage.

(Perma-Skin epoxy coatings are product of Dennis Chemical Co., Dept. CP, 2701 Papin St., St. Louis 3, Mo. . . . or for more information check CP 1231 on handy form opposite last page.)

If you **MUST** stop Corrosion

KEL-F® PLASTIC WILL

KEL-F Plastic Molded and Fabricated Valve Linings, Valve Diaphragms, Gaskets, Ring Seals, Gauge Crystals, KEL-F Dispersion Coated or Laminated Lined Tanks, Vessels, Reactors, Piping and Tubing can protect your plant equipment against chemical corrosion

KEL-F Fluorocarbon Plastic is the best non-permeable, corrosion-proof material available today. It is inert to virtually any type of chemical attack—including mineral acids, oxidizing agents as well as strong caustics. When nothing else will protect equipment, KEL-F Plastic usually will.

HERE ARE SOME OF ITS OUTSTANDING CHARACTERISTICS:

Temperature Tolerance
Exhibits satisfactory properties over a temperature range of approximately 710° F. (—320° F. to 390° F.)

High Compressive Strength
Pressures of 8,000 psi result in only 4% to 5% permanent set. Line seals are retained longer when gaskets and O-ring seals are made of KEL-F Plastics.

Non-Adhesive
KEL-F Plastic is non-wetting even after long periods of immersion. Surface is anti-fouling when in contact with even the most viscous liquids.

KEL-F Plastic is a thermoplastic and easy to fabricate. It is readily molded by extrusion, transfer and injection. Available in sheets, rods, tubing and film, it can be fabricated, heat formed, machined and heat-sealed by a growing list of experienced fabricators.

New! KEL-F Plastic Dispersions

KEL-F Plastic Dispersions have been developed for bake-coating of metallic surfaces that must be corrosion resistant, anti-adhesive and electrically non-conductive. These Dispersions can be applied by spraying, spreading or dipping.

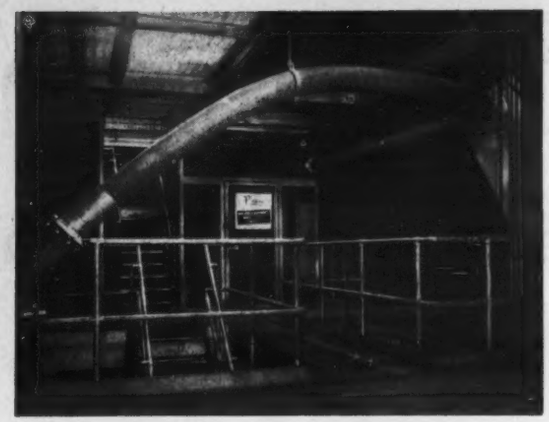
The full story of what KEL-F will do for you is worth having. Write or call for additional information.

KELLOGG

THE M. W. KELLOGG COMPANY
Chemical Manufacturing Division,
P. O. Box 469, Jersey City, N. J.
SUBSIDIARY OF PULLMAN INCORPORATED

®Registered trademark of The M. W. Kellogg Company's fluorocarbon polymers.

When inquiring check CP 1232 opposite last page



"GOODITE"
Flexible RUBBER PIPE

Easily Installed for the Safe, Economical Handling of Various Chemicals, Acids and Highly Abrasive Materials, Wet or Dry, Hot or Cold.

"GOODITE" Flexible Rubber Pipe has extreme flexibility; a tube that is highly resistant to abrasive wear and the permeation of liquids or gases, and a carcass that will not kink or collapse, even on sharpest bends. Each construction is especially engineered for the service involved.

"Goodite" is consistently successful in the heaviest services. Chemicals, acids, sand, gravel, stone, coke breeze, bituminous screening, pulverized coal, fly ash, etc., are all handled most economically through this flexible rubber pipe. Power plants, especially, use "Goodite" as a coal chute between the overhead storage bins and the automatic stokers.

Made in all sizes from 5" to 12", inclusive, in maximum lengths of 50 feet.

"KEMITE" DUCT

Made for lighter service than "Goodite", but of generally same construction, in sizes from 1" to 4", inclusive.

"FLANG-LOK" FLANGES

Installation of "Goodite" Pipe is greatly simplified, under all conditions, by the use of "Flang-Lok" Flanges. Where these flanges are used, "Goodite" or "Kemite" are furnished with built-up "Flang-Lok" ends, providing a complete rubber-to-rubber seal at the connection.

"Flang-Lok" Flanges turn independently of the rubber duct or pipe, and bolt holes are aligned by turning flange, only. Standard drilling facilitates bolting to regular pipe flanges for terminal connections. No gaskets or washers are required, and a full, unobstructed flow through the connection is assured, without metal contact with conducted material.

Contact Our Nearest Branch for Details and Prices

GOODALL RUBBER COMPANY

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

Branches Philadelphia • New York • Boston • Pittsburgh • Indianapolis • Chicago • Detroit • St. Paul Los Angeles • San Francisco • Seattle • Spokane • Portland • Salt Lake City • Denver Houston • Goodall Rubber Company of Canada, Ltd., Toronto • Distributors in Other Principal Cities

Est. 1870

When inquiring check CP 1233 opposite last page

Chemical-resistant paints are odorless . . .

particularly advantageous in breweries, packing plants, and for food processing

Odorless paints with excellent resistance to acids, alkalis, and cleansing agents have recently been made available. These coatings should prove to be of particular advantage in breweries, packing plants and other food processing operations where odor problems might seriously interfere with production. Low temperature resistance of coatings also makes them ideal for use in cold storage and refrigeration areas.

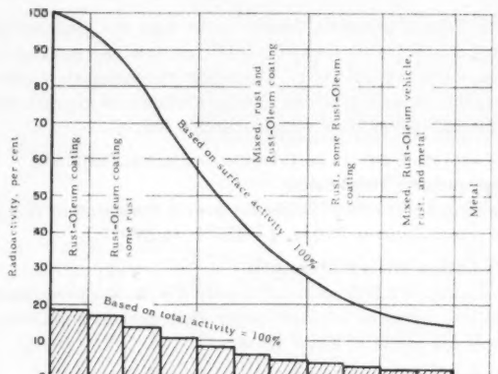
Coatings are based on a vehicle formulation of chemical-resistant film-forming resins dissolved in odorless solvent distilled from petroleum. Products have excellent adhesion, provide good hiding, and are easy to apply. They are also resistant to mold and fungi.

(Odorless coatings are products of Prufcoat Laboratories, Inc., Dept. CP, 50 East 42nd St., New York 17, N.Y. . . . or for more information check CP 1234 on handy form opposite last page.)

Technical report provides proof that fish-oil primer coating penetrates rust . . .

research indicates why primer forms firm bond with minimum surface preparation

Results of research work conducted by Battelle Memorial Institute, which are presented in 22-page technical report, show that manufacturer's fish-oil based primer does penetrate rust to the bare steel surface in measurable quantities. The experimental work confirms the value of the primer in forming a firm bond between the bare steel and top coats in cases where only a minimum surface preparation is possible.


Radioactivity, per cent
Distance From Coating Surface, mils
Rust-Oleum coating
Rust-Oleum coating some Rust
Based on surface activity = 100%
Mixed, rust and Rust-Oleum coating
Rust, some Rust-Oleum coating
Mixed, Rust-Oleum vehicle, rust, and metal
Metal
Based on total activity = 100%

Composite curve showing penetration of radioactive vehicle component of coating into rust layers on steel

"Stop searching Beardsley! We've just discovered Clearsite Plastic Containers."

Moisture-tight! Dust-proof! Non-toxic! Just three of many reasons why Clearsite makes an ideal container. Available in many sizes and varieties of closures. Any trade-mark or label can be multi-color printed right on the feather-light, shatter-proof container.

Write for free samples and descriptive literature.

CELLUPLASTIC CORPORATION

General Offices:
48 Avenue L, Newark 5, N. J.

When inquiring check CP 1235 opposite last page

FOR STRONG CORROSION RESISTANT PIPING

Specify these injection-molded PVC fittings and flanges

Tube Turns Plastics, Inc. offers unplasticized PVC fittings made by the exclusive Hendry process. These injection molded fittings are superior to those made by conventional methods—minimum tensile strength of High Impact is 6000 psi, of Normal Impact, 7000 psi. Injection molding provides highest density, complete homogeneity. Tube Turns Plastics' fittings are non-toxic and completely inert. Resist both internal and external corrosion and will handle most chemicals up to 165°F. Investigate PVC for piping your corrosive materials. For booklet write Tube Turns Plastics, Inc., Dept. PA-10, 224 East Broadway, Louisville 1, Kentucky.

TUBE TURNS PLASTICS, INC.

224 East Broadway • Louisville 1, Kentucky

Call your **TUBE TURNS PLASTICS'** *Distributor*

When inquiring check CP 1236 opposite last page

In the investigation, a radioactive fish oil was prepared by esterification of C^{14}-labeled glycerol and fish-oil fatty acids obtained by saponification of the original fish oil. This oil was converted into manufacturer's vehicle and blended to yield a radioactive primer coating.

The radioactive product was then applied to rusted steel specimens. Degree of penetration of the radioactive component of the product into the rust layer was determined by a radioactive lapping technique. A measurable amount of radioactivity was detected wherever rust was observed on the steel specimens, thus indicating that measurable quantities of the fish-oil component of primer penetrate rust layer of rusted steel to the bare surface.

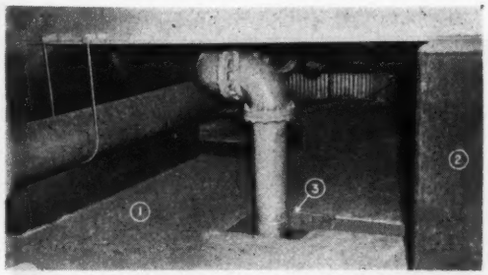
(Battelle Memorial Institute technical report may be obtained from Rust-Oleum Corp., Dept. CP, 2799 Oakton St., Evanston, Ill. . . . or for more information check CP 1237 on handy form opp. last page.)

Protects against acid corrosion of concrete-surfaced areas with resin coatings . . .

increases chemical and abrasion resistance

Uses: Protection of floors, tank foundations, piers, and other concrete surfaced areas exposed to acid spillage or immersion.

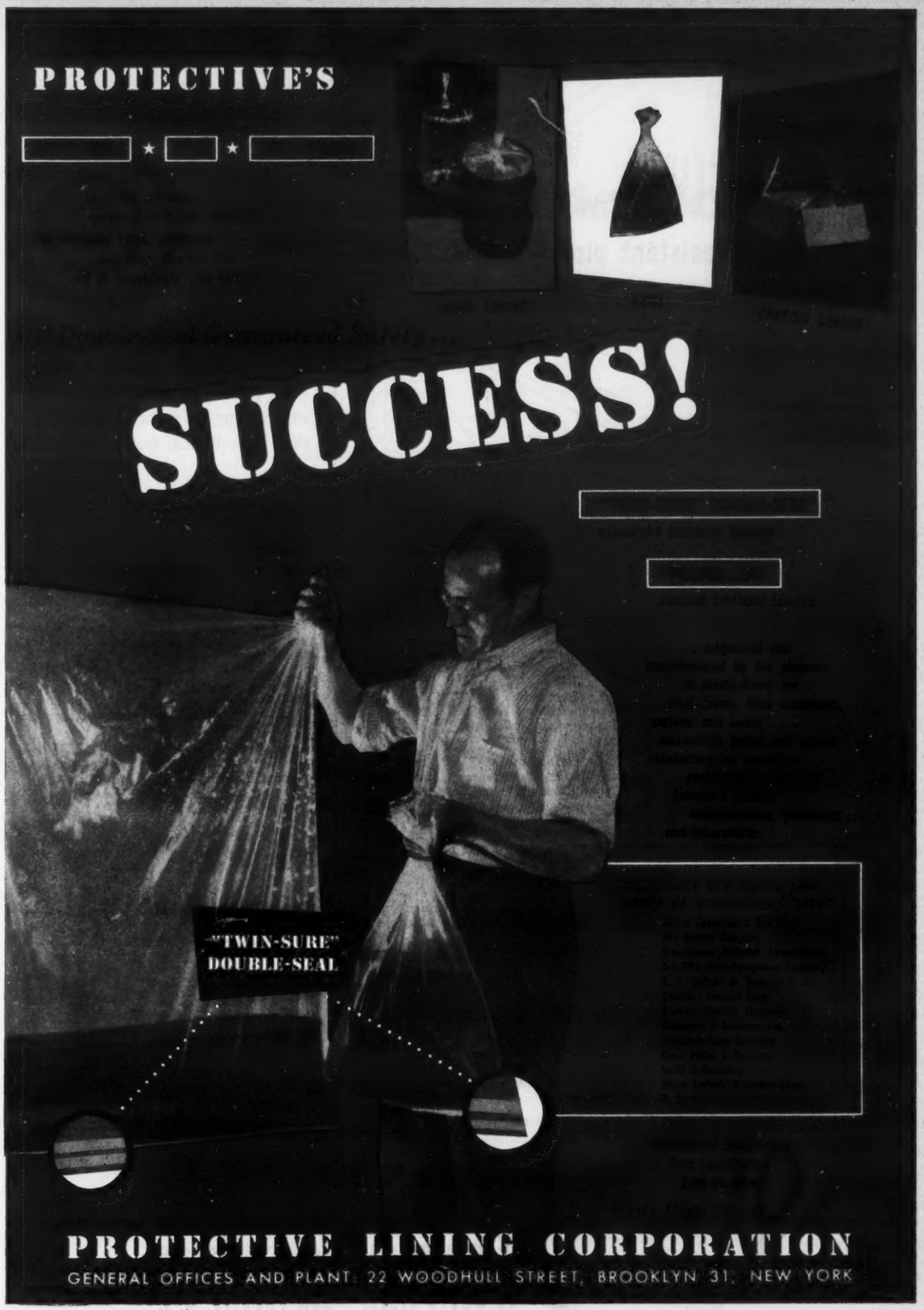
Features: Increased strength, abrasion resistance, chemical and thermal resistance for concrete, acid brick, and tile.



1) Reinforced plastic base surfacing; 2) Thermosetting resin, hardening agent, and filler; 3) resinous bonding cement

Description: Thermosetting plastic base surfacing reinforced with glass cloth for pickling tank piers and pump pits is designated Ceilcrete "B". A mixture of thermosetting resin, hardening agent, and filler designated Corocrete is for application to concrete floor areas. Corobond, a synthetic resinous bonding cement, is used for brick and tile.

(Ceilcrete "B", Corocrete, and Corobond are products of Ceilcote Co., Inc., Dept. CP, 4834 Ridge Road, Ceveland 9, Ohio . . . or for more information check CP 1238 opposite last page.)



When inquiring check CP 1239 opposite last page

85 to 100% of your corrosion-resistant piping needs now available from 1 source

There is no single material for chemical piping that can handle all corrosive fluids . . . and do it economically. To meet all needs, American Hard Rubber Company has developed and refined no less than eight basic types of corrosion-resistant rubber and plastic pipe and tubing . . . plus a wide variety of fittings, valves, pumps, and other equipment for assembling completely protected chemical systems. ACE distributors and field engineers will be happy to make recommendations . . . call ACE first.

WHICH PIPE SHOULD YOU USE . . .		WHERE . . . WHEN?
ACE-ITE Threaded Pipe ½" to 6"	General purpose rubber-plastic blend. Tough, impact resistant. Odorless, tasteless. Economical.	Handles most common chemicals to 170°F. except a few strong acids and certain organic solvents.
RUBBER-LINED STEEL Flanged Pipe 1½" to 24" and up	Strength and pressures of steel plus resistance of hard rubber. Soft rubber interlayer aids shock resistance.	Finest resistance to alkalis, most inorganic acids, many organic acids, all salts. Ideal for bleaches.
ACE TEMPRON Threaded Pipe 1" to 8"	For hot corrosives to 260-275 deg. F. Rigidity and resistance better than previous nitriles.	Best anywhere for *hot* inorganic chemicals, acids. Also unusually wide variety of organics at room temp.
ACE RIVICLOR Threaded Pipe ½" to 4"	Rigid plastic, special PVC. Outstanding aging characteristics. Good cold impact strength.	Lies between Saran and Parian. Not affected by most inorganic acids and alkalis. Good for many organics also.
ACE PARIAN Threaded Pipe ½" to 2"	Odorless, tasteless, rigid polyethylene. Not strongest plastic, but best for sub-zero uses.	Best resistance of any plastic at room temp. except to acetic acid. Good for alkalis, acids. many organics.
ACE HARD RUBBER Threaded Pipe ¼" to 8" Flanged Pipe 1½" to 8"	The oldest, still tops. Widest range of fittings of any rigid non-metallic pipe.	Extreme resistance to alkalis, most inorganic acids, many organic acids, all salts. Ideal for chlorine, fluorine.
ACE SARAN Threaded Pipe ½" to 4" Tubing ⅛" to 1¼"	Odorless, tasteless, general-purpose rigid pipe and semi-flexible tubing. High pressures.	Excellent . . . not affected by most inorganic acids and alkalis. High resistance to most organics.
ACE-FLEX Flexible Tubing ⅛" to 1¼"	General-purpose transparent flexible tubing. Non-toxic, odorless, tasteless. Can steam-sterilize.	Very good resistance to most inorganic acids and alkalis. Resists many organics at room temperature.

ACE® rubber and plastic products

AMERICAN HARD RUBBER COMPANY
93 WORTH STREET • NEW YORK 13, N. Y.

When inquiring check CP 1240 opposite last page

Corrosion, erosion from water — how to control it

Examples of how optimum control measures may avoid costly, unsound water treatment are given in six-page folder. Practical measures may include minor physical or operating changes, as well as improvements in chemical treatment.

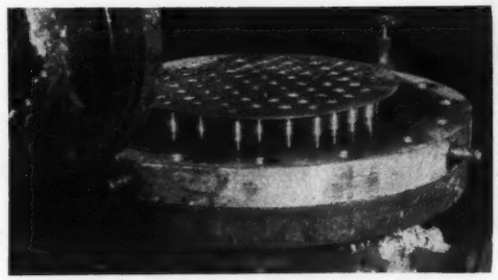
Bul 290112 is issued by Hall Laboratories, Inc., Dept. CP, 323 Fourth Ave., Pittsburgh 30, Pa. When inquiring reader may simply specify CP 1241 on handy form which is located opposite last page.

Du Pont uses titanium "top hat" to combat severe corrosion in condenser tubes . . .

insert provides protective sleeve to top three or four inches of stainless bundle

Problem: At a Du Pont plant an entire tube assembly of a condenser handling nitric acid vapors had to be replaced every four to six months. Vapors of 60% nitric, entering the header at 300 psi and 195°C, were causing severe corrosion at the tube inlets. The top three or four inches of the stainless steel bundle were being eaten away.

Solution: About a year and a half ago, Du Pont installed a "top hat" insert fabricated entirely of titanium. Insert consists of a round, thin piece of titanium about a foot in diameter to which a cluster of 70 thin-wall tube inserts of titanium was welded.



Titanium "top hat" insert being placed in condenser. It is at this point that condenser had been subjected to most severe attack by hot nitric acid

The 70 tubes of the insert fit snugly inside the tubes of condenser affording protection to the topmost three or four inches of the condenser — the area most seriously affected by corrosion.

Results: When the titanium insert was removed for inspection after 14 months service — eight of those months were on a 24-hr-per-day basis — it showed no visible signs of corrosion, except for a slight discoloration. Titanium's performance has

already proved to be 2½ to 3 times better than the material formerly used.

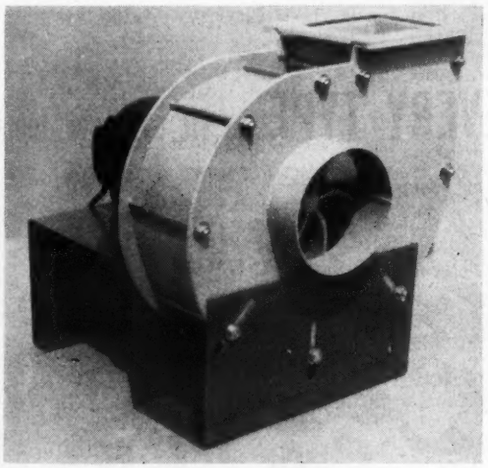
(Titanium mill products for inserts were fabricated by Rem-Cru Titanium, Inc., Dept. CP, Midland, Pa. . . . or for more information check CP 1242 on handy form opposite last page.)

(Mill products were produced from titanium sponge which is a product of E. I. du Pont de Nemours & Co., Inc., Dept. CP, Nemours Bldg., Wilmington 98, Del. . . . or for more information reader may simply check CP 1242A on the convenient Reader Service slip which is located opposite last page.)

Can remove corrosive fumes at temperatures to 200°F . . .

solid plastic fans designed for use with acid or alkali vapors

Line of Rigivin (rigid vinyl, high impact) and Rigidon (glass fiber reinforced plastic) fans are available for removal of fumes under corrosive conditions. Former type is designed for use with strong acid or

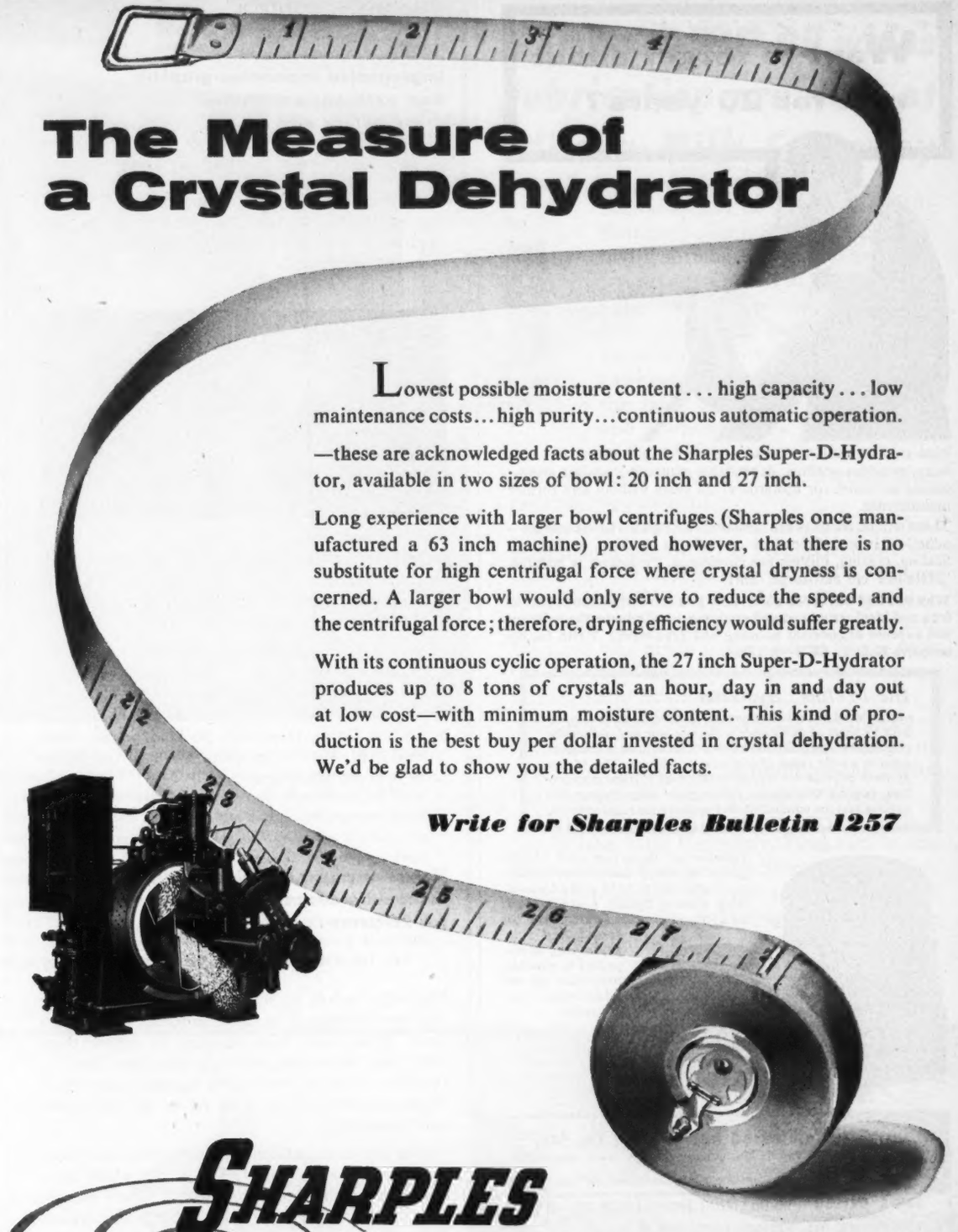


Fan's smooth interior surfaces increase efficiency

alkali fumes where maximum corrosion resistance is required, while latter is recommended for most acid services and high temperature applications to 200°F.

Smooth interior surfaces of either type increase fan efficiency and limit buildup of solids carried by the fumes. High efficiency, quiet operation, and non-overloading characteristics are features incorporated into units.

(Rigivin and Rigidon plastic fans are products of Heil Process Equipment Corp., Dept. CP, 12901 Elmwood Ave., Cleveland 11, Ohio . . . or for more information check CP 1243 on handy form opposite last page.)



The Measure of a Crystal Dehydrator

Lowest possible moisture content . . . high capacity . . . low maintenance costs . . . high purity . . . continuous automatic operation.

—these are acknowledged facts about the Sharples Super-D-Hydrator, available in two sizes of bowl: 20 inch and 27 inch.

Long experience with larger bowl centrifuges (Sharples once manufactured a 63 inch machine) proved however, that there is no substitute for high centrifugal force where crystal dryness is concerned. A larger bowl would only serve to reduce the speed, and the centrifugal force; therefore, drying efficiency would suffer greatly.

With its continuous cyclic operation, the 27 inch Super-D-Hydrator produces up to 8 tons of crystals an hour, day in and day out at low cost—with minimum moisture content. This kind of production is the best buy per dollar invested in crystal dehydration. We'd be glad to show you the detailed facts.

Write for Sharples Bulletin 1257

SHARPLES

THE SHARPLES CORPORATION
2300 WESTMORELAND STREET • PHILADELPHIA 40, PENNSYLVANIA
NEW YORK • PITTSBURGH • CLEVELAND • DETROIT • CHICAGO • NEW ORLEANS • SEATTLE • LOS ANGELES • SAN FRANCISCO • HOUSTON
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When inquiring check CP 1244 opposite last page

Want to forget about rust for 20 years?

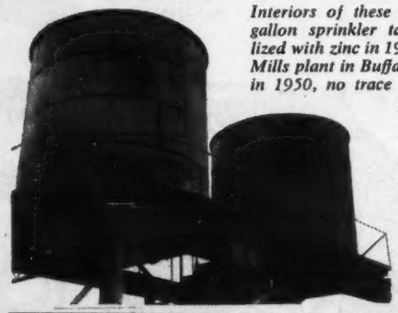
Pure zinc or aluminum, molten-sprayed on iron or steel surfaces, provides positive, dependable protection against atmospheric corrosion for upwards of 20 years without *any* further maintenance.

These unique coatings are *mechanically* bonded to the surface—adhesion is *not* dependent on volatile vehicles or binders. Scaling, crazing, blisters are eliminated. Protection is *positive*. "Metallize 'em and forget 'em!"

Why not find out more about how you can forget about rust on iron and steel structures and equipment—eliminate the nuisance and expense of constant painting and repainting? Write for descriptive Bulletin 62-B—it's free.

the Metco Systems*

—a series of 18 basic engineering specifications developed over 19 years of experience with pure zinc and aluminum coatings on many different types of structures and equipment in a wide range of corrosive conditions. The *Metco Systems* provide for standardization of surface preparation, coating thicknesses and organic aftercoatings for various surface conditions and appearance requirements.



Interiors of these two steel 15,000 gallon sprinkler tanks were metallized with zinc in 1934 at the General Mills plant in Buffalo. Last inspected in 1950, no trace of rust could be found, and zinc remaining is expected to provide protection for an additional 15 to 20 years.

See other examples of metallizing in Sweet's File for Plant Engineers Section 7a/Me

Metallizing Engineering Co., Inc.
1143 Prospect Ave., Westbury, L. I., New York • cable: METCO
In Great Britain:
METALLIZING EQUIPMENT COMPANY, LTD.—Chobham near Woking, England

DON A. WATSON METALLIZING ENGINEERING CO., INC.
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☐ Please send me, without obligation, Bulletin 62-B.
☐ Please have Metco Field Engineer call.
NAME
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CITY ZONE STATE

When inquiring check CP 1245 opposite last page

Impregnated impervious-graphite heat exchangers withstand dilute sulfuric acid . . .

units are used in rayon spinning industry

Accompanying photograph shows the first two impregnated impervious graphite heat exchangers destined to replace 12 corroded units in the rayon spinning industry. Impervious graphite will satis-

factorily resist the dilute solution of sulfuric acid, sodium sulfate, and other salts being handled. This is the rayon spin bath solution, which is heated by the exchangers.

(For more information on Karbate impervious-graphite heat exchangers, built jointly by The Colonial Iron Works and National Carbon, contact National Carbon Co., Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N. Y. . . . or check CP 1246 on handy form opposite last page.)

Valves on paper mill digesters resist sulfurous acid for 20 years . . .

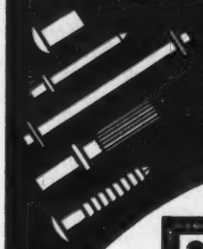
are fabricated from KA-2SMo stainless alloy

High-alloy valves in service in a Wisconsin paper mill have withstood corrosive sulfurous acid for 20 years. It has never been necessary to remove them from line for repairs although they have been in constant service on four sulfite digesters since 1934. Eight-inch angle valves, check valves, and other sizes and types are in use.

Valves first manufactured for this service were fabricated from stainless steel alloy, KA-2, which later, when the carbon content was lowered, became KA-2S, and still later, with the addition of molybdenum, KA-2SMo. The latter alloy contains 18 to 20% chormium, 8 to 10% nickel, 2 to 3% molybdenum, and a maximum of .07% carbon.

(Valves are product of Hasco Valve and Machine Co., Dept. CP, 1263 N. 70th St., Milwaukee 13, Wis. . . . or for more information check CP 1247 on handy form opposite last page.)

CORROSION RESISTANT



RIVETS • NAILS
SCREWS
FASTENERS
in
STAINLESS STEEL
MONEL • NICHROME
COPPER ALLOYS
SILICON BRONZE
ALUMINUM
NICKEL SILVER
Hassall
Established 1850

Hassall fasteners are cold headed for maximum strength, lowest cost.

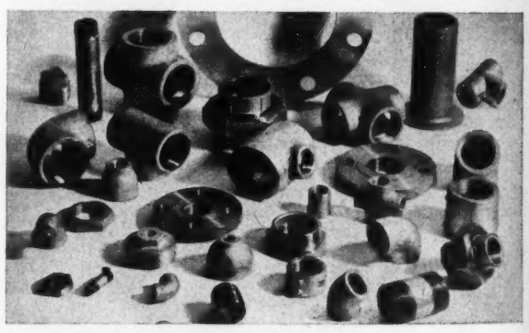
Special fasteners of all types, in any metal are a HASSALL specialty. Small as well as large quantities economically produced. The use of special cold forged parts may cut your parts cost and reduce your assembly cost.

We have a variety of raw material in stock. Our delivery is fast. If you have a fastening problem, tell us about it . . . we may have the answer.

JOHN HASSALL, INC. P.O. Box 2196 Westbury, Long Island, New York

When inquiring check CP 1248 opposite last page

EVERY TYPE to fit every problem



INCO-CAST Fittings
CORROSION-RESISTING
Monel® Nickel and Inconel®

- Resist most corrosives
- Withstand high and sub-zero temperatures
- Strong, tough, sound
- Protect product purity
- Pressure-tested
- Economical in cost
- Controlled alloy composition
- All standard types and sizes in threaded and welding fittings
- Fast service on rated orders to all points from conveniently located distributor stocks
- Special shapes and sizes made to order

WRITE for handy price list catalog. Contains full information, and will be sent you promptly. No obligation.

INCO **The International Nickel Company, Inc.** 67 Wall Street, New York 5, N. Y.

When inquiring check CP 1249 opposite last page

Breakage and contamination reduced with Teflon on steel agitator

Uses: Agitation of highly corrosive mixtures.

Features: Solid Teflon blade and Teflon-coated shaft reduce breakage, product contamination.

Agitator has solid Teflon blade and Teflon-coated steel shaft

Description: Agitator is 72" in length. Blade is 36" wide by 18" deep curved on the bottom. The steel shaft is covered with Teflon bonded to it. Commodity never touches the steel.

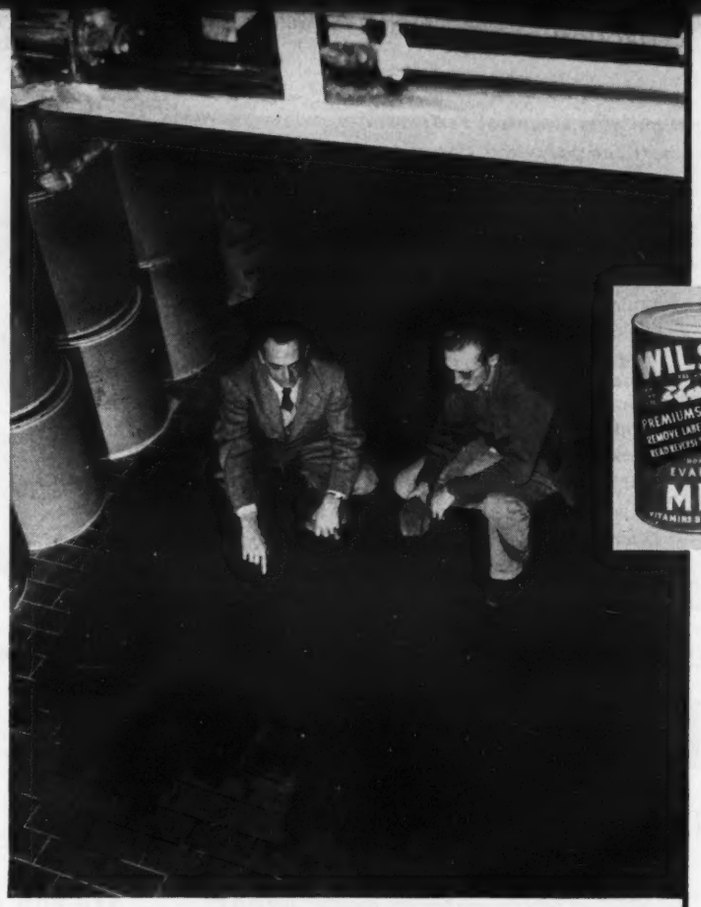
(Teflon agitators are a product of John L. Dore' Co., Dept. CP PO Box 7772, Houston 7, Texas . . . or for more information check CP 1250 opposite last page.)

Composite metal resists corrosion

Corrosion-resistant composite metal having an integral and continuous bond is described in four-page folder. This clad metal is produced by a high-vacuum brazing process, and makes available a wide variety of metals and alloys for corrosive services.

Folder on Hortonclad is issued by Chicago Bridge & Iron Co., Dept. CP, 332 S. Michigan Ave., Chicago 4, Ill. When inquiring specify CP 1251 on handy form opposite last page.

For more information on product at right, specify CP 1252 . . . see information request blank opposite last page.



Taylor Wiham, Wilson Milk Company (right), and John Pirtle, Standard Oil lubrication specialist, inspect oil stain on otherwise spotless floor, the result of previous oil leakage from overhead hydraulic bin loader. Leakage has been eliminated through use of STANODRIP Oil No. 29. Helping customers with lubrication problems is something John Pirtle is well equipped for. John has an engineering degree from Rose Polytechnic Institute, has completed Standard Sales Engineering School and has a number of years of field technical service experience. Customers find this experience and training pay off for them.

STANODRIP *Oil whips lubrication problem at Wilson Milk Company*

MANAGEMENT OF THE Wilson Milk Company plant, Sheridan, Indiana, had a serious lubrication problem. STANODRIP Oil solved it.

In overhead bin loaders, hydraulic rams push powdered milk along conveyor chute to weighing machine. Leakage of lubricant from rams on the floor below caused a sanitary and safety problem. Packings were replaced every two months but leakage often recurred as early as two weeks after packing replacement.

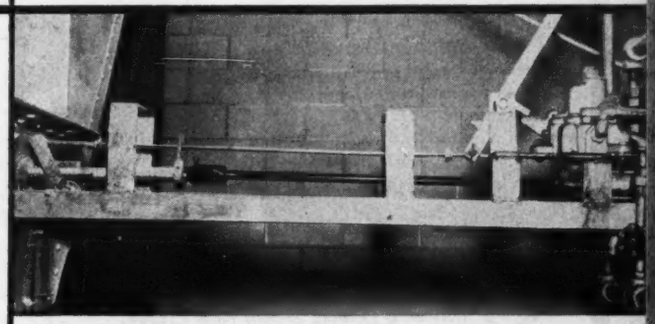
Then Mr. Taylor Wiham, Assistant Superintendent, called in John Pirtle, Standard Oil Industrial lubrication specialist. Mr. Wiham asked about STANODRIP Oil and its possible use as a solution to this lubrication problem. Decision was made to convert to STANODRIP Oil No. 29. Old oil was removed, packings replaced and STANODRIP installed.

In more than 8 months since installation of STANODRIP Oil, there has been no leakage, no packing replacement. Hydraulic rams are lubricated without oil dripping or creeping.

Maybe STANODRIP Oil can serve you as it has Wilson Milk Company. Find out. In the Midwest, call your nearby Standard Oil lubrication specialist. Or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY
(Indiana)



Three bin loaders like the one shown here dripped oil until converted to STANODRIP. No leaks have occurred in 8 months since. Previously, packings were replaced every two months. Even then leakage often recurred as early as two weeks after repacking.

he has the answer—

Cat-a-lac

corrosion inhibiting coatings

A unique and versatile system of protective coatings...a series of Film-formers that possess excellent adhesion to all surfaces and offer unusual chemical and solvent resistance plus flexibility. Cat-A-lac Coatings offer industry air-curing films superior to hi-baked films in chemical resistance.

what is Cat-A-lac?

Cat-A-lac is a pure *unesterified Epoxy-Resin System.* Cure is obtained by adding controlled amounts of catalyst (coupling agent) prior to application. The catalyst or coupling agent is a combination of primary amines, quite basic in nature. Through the aid of the catalyst, cure is by end-chain coupling. Cross-linkage polmerization is the end result. Application consists of Cat-A-lac Prime Coat plus Cat-A-lac hi-gloss Top Coat of mirror smoothness to color specification.

CAT-A-LAC PRIMER, ALONE, HAS THREE TIMES THE CORROSION INHIBITING QUALITY OF ANY KNOWN SPECIFICATION PRIMER. Any type of top coat may be applied over Cat-A-lac primer.

Cat-A-lac offers positive resistance to all elements listed in the illustration above. If you have a corrosion, erosion, galvanic action, alkali, acid or solvent resistant problem, we invite you to write for your copy of "Finch Facts", technical data on Cat-A-lac coatings.

FPC **FINCH PAINT & CHEMICAL CO.**
Division of Desmond Brothers Paint Company
Torrance, California

When inquiring check CP 1253 opposite last page

Highlights chemical resistance chart for polyvinyl chloride

Chemical resistance to various reagents of polyethylene, non-plasticized polyvinyl chloride, and high impact polyvinyl chloride is detailed in eight pages of 46-page, two-color booklet.

Molded and fabricated products listings include tubing, pipe, fittings, valves, laboratory ware, ducting, exhaust hoods, and fans. Additional sections present line drawing of corrosion-free duct system, plastic welding equipment, and specifications on sheet, rod, and block stock of polyethylene and unplasticized polyvinyl chloride.

Booklet on polyethylene and polyvinyl chloride is available from American Agile Corp., Dept. CP, PO Box 168, Bedford, Ohio. When inquiring specify 1254 opposite last page.

Steel water tubes on condensers last 4-5 times longer since treatment was changed . . .

phosphate-pH control cuts water-side corrosion by 92% at Richfield Oil

Problem: Steel water tubes on hydrocarbon fraction and process condensers became clogged by corrosion products and failed at the Watson Refinery of Richfield Oil Corp. in Wilmington, California. Not only were the many shutdowns interfering with plant's schedule, but it was difficult to keep hydrocarbons out of cooling water. As a result these were not only wasted, but it was also hard to maintain chlorine residuals at the point where algae were controlled.

Before 1945, the refinery had no definite schedule of cooling water treatment. Considerable scale developed, and heat transfer problems were experienced within two or three weeks following each cleaning. Most tubes had to be drilled to effect cleanout. Average condenser tube life was 18 months, although tubes developed leaks long before that. Part of the plant was built during World War II when it was impossible to get seamless 12-gage steel tubes. Butt-welded, 16-gage tubes were substituted, and corrosion problems in this part of the plant were aggravated.

Solution: In late 1945, a method known as "high phosphate-low pH control" was started in one of refinery's nine cooling systems. This was one of the first installations to use this method. A pH of 6.5-7 was maintained in the unit, with metaphosphate residual at 10-15 ppm. This particular unit had a 30,000 gpm recirculation rate.

Results: Test strips in one of the cooling towers show corrosion has been cut 92%. Refinery can

UCILON PROTECTIVE COATINGS

solve many paint problems

If you're plagued by constant maintenance and corrosion damage due to acids, alkalies, salt solutions, water and other active chemicals, here may be your answer.

A variety of Ucilon* Protective Coating Systems, using either air-drying or baking coatings, are available to solve corrosion problems. Applied like ordinary paint, Ucilon Coating Systems resist many of the severest service conditions. The line includes vinyl, phenolic, chlorinated rubber, Neoprene and other chemical resisting coatings. Send for Bulletin MC-9.

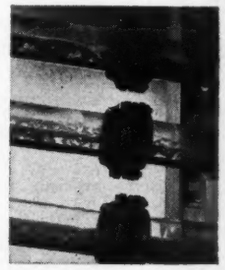
*Trademark

UCILON Protective Coatings

UNITED CHROMIUM DIVISION
METAL & THERMIT CORPORATION
100 East 42nd St., New York 17, N. Y. • Detroit 20, Mich.
Waterbury 20, Conn. • East Chicago, Ind. • El Segundo, Calif.
In Canada: United Chromium Limited, Toronto 1, Ont.

When inquiring check CP 1255 opposite last page

Are you missing the corrosion resistance of PYREX® pipe because you think it will break?



A plant manager says this about PYREX pipe: "There was no breakage during installation. There have been no lines broken because of the product handled, the temperature involved, or the age of the pipe. In short—*there has been no breakage.*"

Product lines in this plant have been PYREX pipe since 1943. Before the company switched, corrosion in the metal lines made cleaning difficult, frequent replacement made maintenance costly.

Engineers and operating men in hundreds of plants are running hard-to-handle fluids like sulfuric, hydrochloric, nitric and acetic acids; chlorinated hydrocarbons, hydrogen peroxide, bromine, brines and low concentration alkali solutions through their PYREX pipelines with no problems whatsoever.

Your own pipe fitters can install PYREX pipe. It's easy to clean. Maintenance is practically nil. It's durable and costs about the same initially as other corrosion resistant piping. But even if it should cost more than the piping you now use, PYREX pipe would quickly make up the difference in low installation cost, low maintenance cost, long service.

Make this check—Probably plants near you use PYREX pipe, know its value in terms of personal experience. We'd like to send you their names so you can talk to people who use glass pipe daily. Ask for a list. Use this publication's reader service for added information.

CORNING GLASS WORKS
CORNING, N.Y.
Corning means research in Glass

When inquiring check CP 1256 opposite last page

now make scheduled runs without shutting down to clean water side of condensers. When water side is opened for a scheduled inspection, it is often found that washing with water is all the cleaning needed. Tubes now last 6 to 8 years, instead of the former 1½.

Man-hours spent in cleaning have been reduced considerably. Since tubes are tight, no difficulty has been experienced in control of entire system. All cooling water systems in refinery (these recirculate 145,000 gpm) now use this method of water treatment.

(Phosphate-pH control water treating system is a development of Hall Laboratories, Inc., Dept. CP, Hagan Bldg., 323 Fourth Ave., Pittsburgh 30, Pa. . . . or for more information check CP 1257 on handy form opposite last page.)

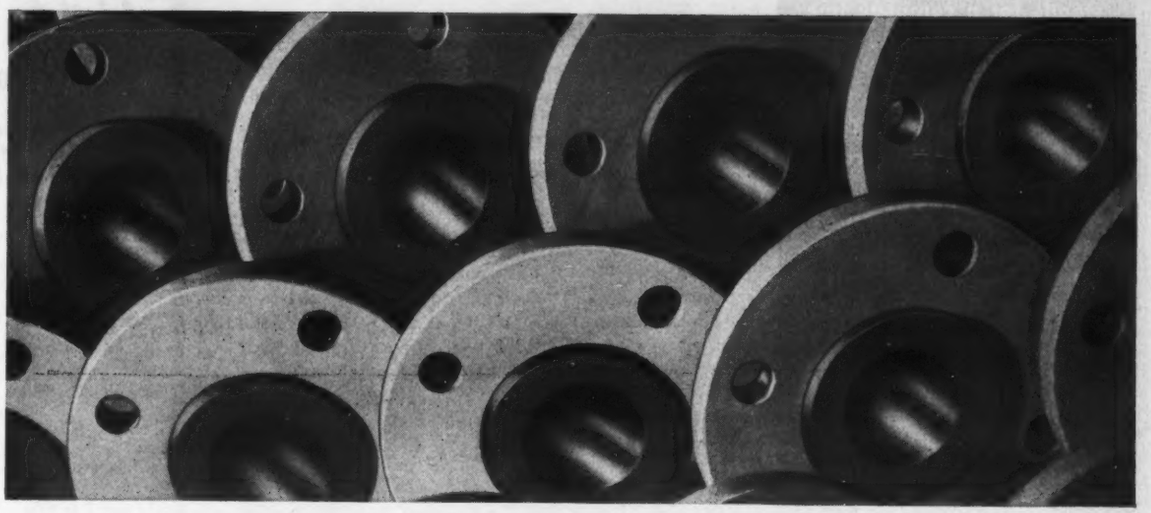
Gives engineering data on stainless steel

Sixteen-page engineering data booklet includes design and dimensional information on flange drilling templates, flange and ring-joint facings, stainless steel pipe, pipe threads, thread engagement; pressure-temperature ratings and conversion factors, resistance of fluid flow; hardness conversion tables, metal casting factors, physical and mechanical properties of stainless steel. Special materials selection chart covers more than 300 corrosive solutions.

Catalog 55 is issued by Cooper Alloy Corp., Dept. CP, 100 Bloy St., Hillside 5, N. J. When inquiring specify 1258 opposite last page.

For better was to whip corrosion . . .

. . . try the handy Product Directory (starting this issue on page 255). You'll find it an easy "page-locator" for ideas, materials, and services.



You can see why

SARAN LINED PIPE

GIVES LONG, TROUBLE-FREE SERVICE

It's made of corrosion-resistant saran pipe swaged into steel for extra rigidity and strength . . . cuts downtime losses conveying corrosive liquids.

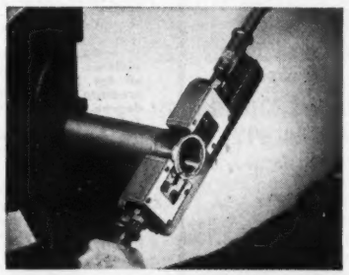
Now you can convey chemicals and many other corrosive liquids without worrying about costly shutdowns due to corrosion. For saran lined pipe, fittings and valves are corrosion-resistant . . . form snug, leakproof joints . . . which won't burst up to 150 pounds working pressure.

They're easily and inexpensively installed because they can be cut and threaded in the field with any standard pipe fitter's tools. Their rigidity means that few supporting members are needed.

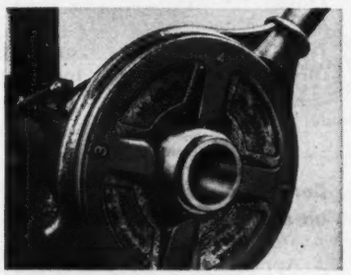
Saran lined pipe, fittings and valves have a proved record in industry of bringing long trouble-free service. If your operation requires superior resistance to most chemicals and solvents, be sure to investigate saran lined pipe. Contact the Saran Lined Pipe Company, 2415 Burdette Avenue, Ferndale 20, Michigan, Department SP527 B-2.

RELATED SARAN PRODUCTS—Saran rubber tank lining • Saran rubber molding stock • Saran tubing and fittings • Saran pipe and fittings.

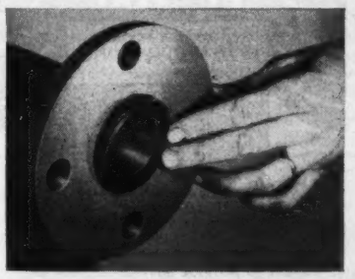
Saran Lined Pipe Can Be Fabricated Right in the Field!



An adapted Beaver Cutter cuts away the end of the steel pipe so that 3/16" of the saran lining is extended. This assures a tight seal after a flange is applied and connected with another flange.



A ratchet type thread cutter makes the standard threads after the Beaver Cutter has been used. A flange or union fitting is attached and tightened until the liner is flush with the fitting.



If two flanges, or a union fitting, are used to make a pipe connection then a full gasket is required. If a flange is made up against a flange fitting or spacer then a half gasket is required.

Saran Lined Pipe is Manufactured by The Dow Chemical Company, Midland, Michigan

you can depend on DOW PLASTICS

DOW

When inquiring check CP 1259 opposite last page

The **VALDURA** name stands for a complete line of specialized industrial maintenance products designed to serve every type of American industry. Typical products are indicated below. Other Valdura Specifics and Exclusives will be identified in future ads. Watch for them! They can solve your toughest maintenance problems.

Here's an advanced alkyd interior paint formulated specifically for the industrial maintenance painter. One-coat type . . . no objectionable odor . . . stays "open" to allow *plenty of lap time.* New favored industrial colors. Flat and Semi-Gloss in matching colors.

●

Pro-Sheen is a painter's type latex with one coat capabilities not found in ordinary latex paints.

▶ Ready to use
▶ Odorless
▶ In white and favored industrial colors

If you have a particular maintenance problem which is urgent just describe it on your regular letterhead and mail to the address below. Your inquiry will be treated as an invitation to provide service . . . not as a license to exert selling pressure!

VALDURA
HEAVY DUTY
PAINT DIVISION
AMERICAN-MARIETTA CO.
101 E. Ontario St., Chicago 11, Ill.

When inquiring check CP 1260 opposite last page

Aluminum oxide refractory coating resists most corrosive agents, including molten metals . . .

approximately twice as hard as tool steel, has melting point above 3600°F

Uses: For application to steel, titanium, carbon, aluminum, magnesium, brass, copper, and glass.

Features: Coating is unaffected by most corrosive agents including many molten metals. It is approximately twice as hard as tool steel, with the melting point above 3600°F. It provides excellent electrical as well as thermal insulation. The coating

Aluminum oxide coating operation

resists chipping, even under direct impact. Slight porosity permits material to hold lubricants, making it well adapted to use as a bearing material.

Description: Aluminum oxide coating operation involves melting ceramic powders in a flame directed at the object to be coated. Operation is as simple as spraying paint, and the procedure is well suited to mechanization. Powder is non-toxic and non-combustible.

(Flame Rock aluminum oxide coating is a product of The Montaine Corp., Dept. CP, 7127 S. Chicago Ave., Chicago 19, Ill. . . . or for more information check CP 1261 on handy form opposite last page.)

Corrosion resistance featured on nickel alloy tubing

Application data, properties, workability and available sizes of nickel alloy tubing are presented in four-page, two-color booklet. Corrosion-resistant properties under a variety of working conditions and services are detailed.

Bulletin T. D. 117 is issued by Alloy Tube Div., Carpenter Steel Co., Dept. CP, Union, N.J. When inquiring specify CP 1262 on handy form opposite last page.

Fights CORROSION HARD

ALPHA 101 AND 102 — Rigid PVC Plastic Pipe

Recommended for 3 out of 4 Chemical Lines

Good at licking corrosive problems. Mighty good for its perfect resistance to hydrochloric . . sulphuric . . nitric acid and more than 186 commonly used chemical corrosives — at lower temperatures and pressures.

When the right **PVC** Pipe handles your fluid lines you solve corrosion problems permanently! That's why

ALPHA 101 Normal Impact Unplasticized Straight **PVC**

or

ALPHA 102 High Impact Unplasticized Modified **PVC** Pipe is increasingly used! ½" to 4" sizes; full line of fittings.

- LIGHT WEIGHT
- EXCELLENT AGING QUALITIES
- NON FLAMMABLE
- HIGH TENSILE STRENGTH

Send for Complete Product Data Today

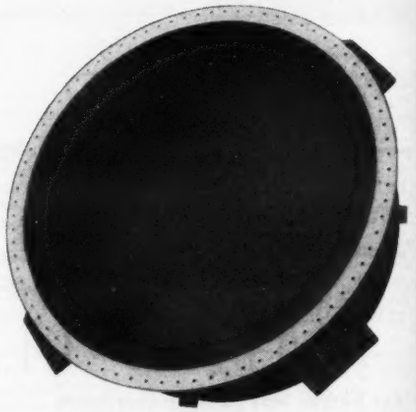
ALPHA PLASTICS INC.
15 NORTHFIELD ROAD
WEST ORANGE, N. J.

When inquiring check CP 1263 opposite last page

KUTZTOWN *Skill*

CREATES A 10-TON CAUSTIC POT

When the job calls for a circular casting with clean surfaces; where dimensional accuracy is a must — KUTZTOWN turns to the Loam Molding floor. Here costly and bulky patterns can be eliminated. Here craftsmen turn the blueprint into 10-tons of molded gray iron. Here experience and technical skill pays off for the customer in quality products — accurate to the Nth degree. The complicated job (pictured at right) is typical of the out-of-the-ordinary castings which KUTZTOWN produces every day!



We'll be happy to place your name on our mailing list to receive regular issues of the "KUTZTOWN REVIEW".

No order is too large or too small for KUTZTOWN to handle!

- GRAY IRON
- PRESSURE IRON
- HIGH TENSILE IRON
- NI-RESIST
- LO-ALLOY IRON
- DUCTILE IRON

KUTZTOWN FOUNDRY & MACHINE CORP.
KUTZTOWN, PENNSYLVANIA

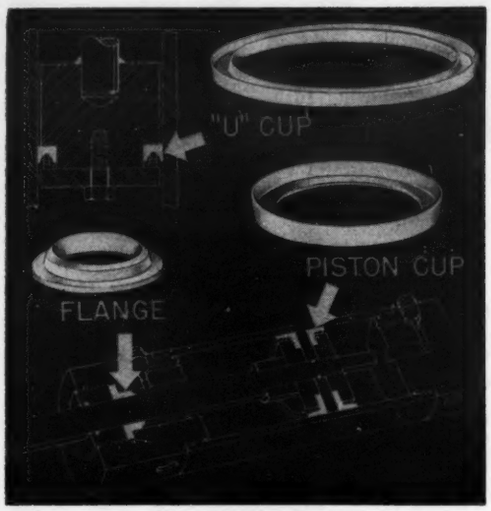
When inquiring check CP 1264 opposite last page

Cylinder packing corrosion controlled with Teflon . . .

provides protection needed with synthetic non-flammable hydraulic fluids

Uses: Hydraulic cylinder packing for use with all synthetic non-flammable hydraulic fluids.

Features: Packings can be used at operating temperatures to 350°F and are self-regulating to compensate for pressure. Piston cup packings are recommended for pressures to 2,000 psi, U-cup packings to 1500 psi, and flange packings to 2,000



Piston cup, U-cup, and flange packings fabricated from Teflon for use with non-flammable fluids

psi. Teflon provides positive protection against corrosive action of all types of synthetic non-flammable hydraulic fluids.

Description: Piston cup packings are available in nominal cup sizes from 1 to 12″. U-cup and flange packings are furnished to either piston or cylinder specifications.

(Teflon hydraulic fluid packings are a product of Crane Packing Co., Dept. CP, 1800 Cuyler Ave., Chicago 13, Ill. Check CP 1265 opposite last page.)

Pictorially illustrates how zinc controls corrosion

Liberal use of drawings, charts, and photos presents the corrosion control characteristics of zinc coating, zinc pigments, and zinc anodes in 32-page, two-color booklet.

"How Zinc Controls Corrosion" is available from American Zinc Institute, Inc., Dept. CP, 60 East 42nd Street, New York 17, N. Y. When inquiring specify 1266 opposite last page.

CAN TYPE VERTICAL PUMP

Now Available in Two Types—FOR APPLICATION to CHEMICAL PROCESSING, REFINING TECHNIQUES, CONDENSATE SERVICE, AND LINE BOOSTER SERVICE

NEW DESIGNS PROVIDE BOTH A PROCESS TYPE AND A TRANSFER TYPE

The process type vertical Hydro-Line pump, especially suited to refining and process pumping offers the following features—1) API-ASME code welding; 2) especially designed containers for either mechanical shaft seals or packing; 3) availability of head and barrel flanges up to 300 lbs. or more; 4) extra heavy wall thicknesses for maximum stability and high safety factor; 5) elliptical barrel bottom design for optimum fluid entrance conditions. The transfer type Hydro-Line pump is of a similar design to the process type differing in materials of construction required for less rigorous service. Both types are extremely flexible in installation, are easy to inspect, service and maintain—can be designed for operation on any available system NPSH. Write for new Bulletin No B-1700.

THE PEERLESS
HYDRO-LINE
ENCASED CLOSE-COUPLED PUMP

CAPACITIES TO	3000 gpm
HEADS TO	1000 feet
DRIVES	As required, vertical solid shaft, or explosion-proof motors; steam turbine.
TEMPERATURES	Up to 400° F.

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
Factories at: Los Angeles, Calif., and Indianapolis, Ind. *Offices:* New York; Atlanta; Chicago; St. Louis; Indianapolis; Phoenix; Fresno; Los Angeles; Dallas, Plainview and Lubbock, Texas; Albuquerque, New Mexico.
Distributors in Principal Cities; Consult your Telephone Directory.

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
301 West Avenue 26, Los Angeles 31, California

Please send me a copy of Peerless Hydro-Line Pump Bulletin No. B-1700.

NAME_____

ADDRESS_____

TOWN_____ STATE_____

CHEM. PRO.

When inquiring check CP 1267 opposite last page

Buflovak Jacketed Grease Kettles are engineered for specific process requirements

...to fit specific processing operation needs

...to provide profitable performance

The kettle illustrated is a Buflovak Jacketed Grease Kettle with a 2500-gal. capacity. It is equipped with a compact 150-hp Cone Gear Drive for operating a Double Motion Agitator, with scrapers, to speed operation. A pneumatic discharge valve saves valuable time. It was designed and engineered by Blaw-Knox engineers to meet the specific requirements of the operation for which it was built.

We can help you solve your kettle problems. Blaw-Knox engineers have had a broad experience in designing and building kettles of every description, from the laboratory—few-gallon, capacity models to ones that process several thousand gallons—not just greases but a large number of varied products. This experience enables our engineers to incorporate in the design of each kettle all the features that are particularly applicable to the operation under consideration. Such features include size of kettle, type of body, agitators, drive, high or low temperature control, method of heating and cooling, heat source, openings and outlets, and so on.

Why not call us and let Blaw-Knox engineers make their recommendations?

A Complete Process Equipment Service

Kettles of every description constitute but one phase of Blaw-Knox Process Equipment design, engineering and fabrication service for the chemical, food, pharmaceutical, plastic and resin, petroleum, rubber and other industries: EVAPORATION • DRYING • FLAKING • MIXING • REACTION IMPREGNATING • VULCANIZING • SOLVENT RECOVERY SOLVENT EXTRACTION • CRYSTALLIZATION • DISTILLATION POLYMERIZATION • GAS CLEANING • GAS ABSORPTION • HEAT TRANSFER • VAPORIZATION • CONDENSATION • STERILIZING LOW AND HIGH PRESSURE PROCESSING

See Our Exhibit in Booth 103
25th Exposition of Chemical Industries
Commercial Museum, Philadelphia
December 5-9, 1955

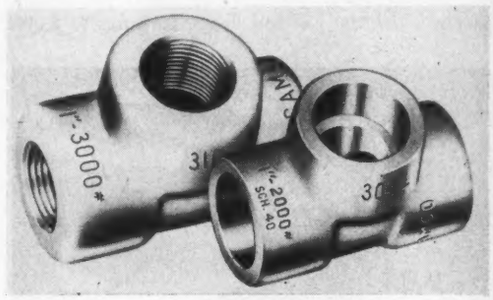
Everything in Process Equipment
BLAW-KNOX COMPANY
BUFLOVAK EQUIPMENT DIVISION
1645 Fillmore Avenue, Buffalo 11, N.Y.

When inquiring check CP 1268 opposite last page

Stainless steel pipe fittings are pressure rated . . .

forged units reinforced for heavy-duty service

Heavy-duty, stainless steel, forged pipe fittings are available at pressure ratings of 2000, 3000, 4000 and 6000 psi. Most sizes and items are available from stock in types 304, 304ELC, 316, and 316ELC stainless steel screwed and socketweld fittings. Reinforcing bands insure maximum strength at



Fittings are reinforced at points of stress

points of stress and extend beyond last thread or depth of socket. All fittings are permanently identified with size, alloy, pressure rating, and heat code.

(Stainless steel pipe fittings are available from Camco Products Inc., Dept. CP, 445 State St., North Haven, Conn. . . . or for more information check CP 1269 on handy form opposite last page.)

Flexibility provided by tubing made from plasticized polyvinyl chloride

Flexibility, chemical resistance, water-white transparency, and resistance to aging are furnished by plasticized polyvinyl chloride tubing. Stock sizes from ⅛ through 1" ID, with 3/16" wall are available.

(Nalgon tubing is product of The Nalge Co., Inc., Dept. CP, 625 S. Goodman St., Rochester 20, N. Y. . . . or for more information check CP 1270 on handy form opposite last page.)

Corrosion headaches? Another installment of "Corrosion Keys" (on copper alloys) starts on page 250

Motor qualifies for use wherever conditions are corrosive . . .

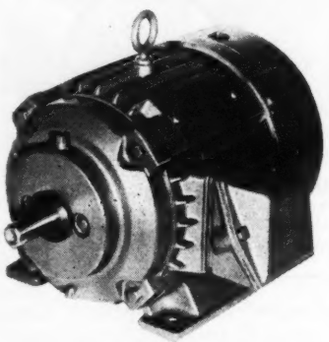
all parts are treated to resist acids, moisture, oils

Uses: In all industries which have inherent corrosive conditions.

Features: AC motor is designed to qualify for use in all Class I, Group D and Class 2, Groups E, F, and G classifications.

Insulation process provides thorough impregnation for high resistance to acids, moisture, and oils.

Description: Motor has cast iron, water-tight conduit box which can be rotated to any desired position for ease of installation. All hardware is treated with protective asphaltum, neoprene shaft slingers are incorporated, and stainless steel components can be supplied if required for application.

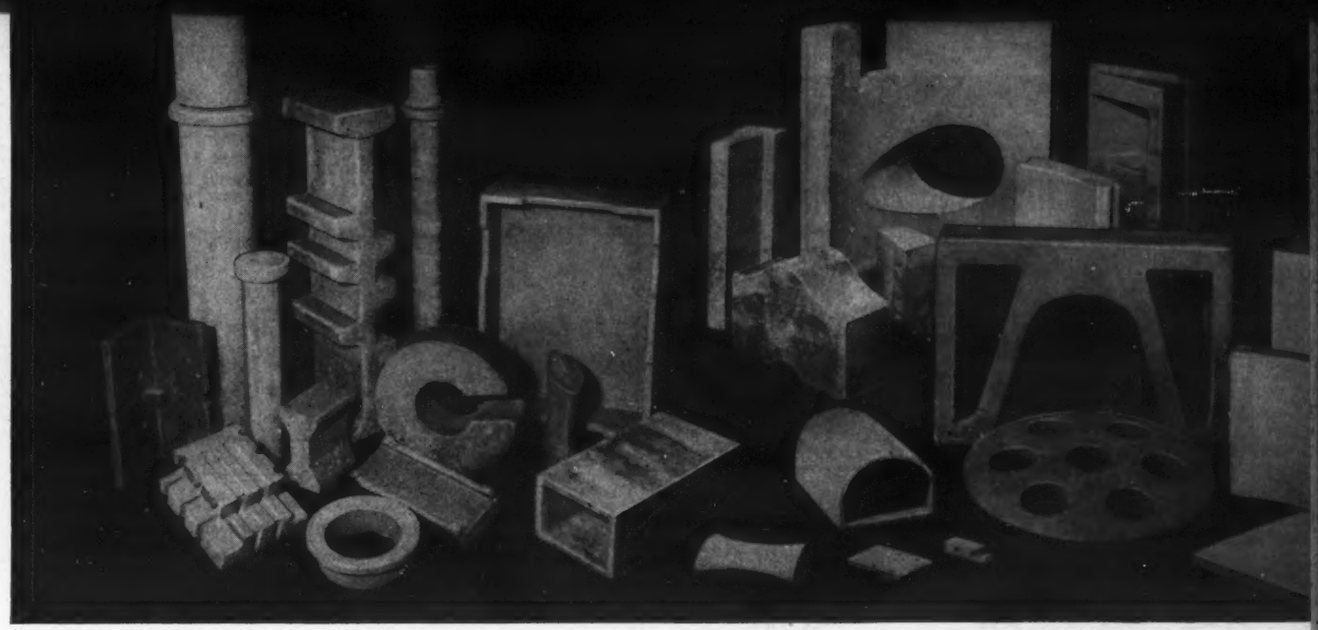


Qualifies for use in all Class I, Group D and Class 2, Groups E, F, and G classifications

Neoprene gasket with pressure knobs securely hold and index each lead while providing a positive seal between frame and conduit box.

(Corrosion-proof AC motor is a product of Reliance Electric & Engineering Company, Dept. CP, 1088 Ivanhoe Road, Cleveland 10, Ohio . . . or for more information check CP 1271, opposite last pg.)

For more information on product at right, specify CP 1272 . . . see information request blank opposite last page.



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BARREL TRUCK loads automatically
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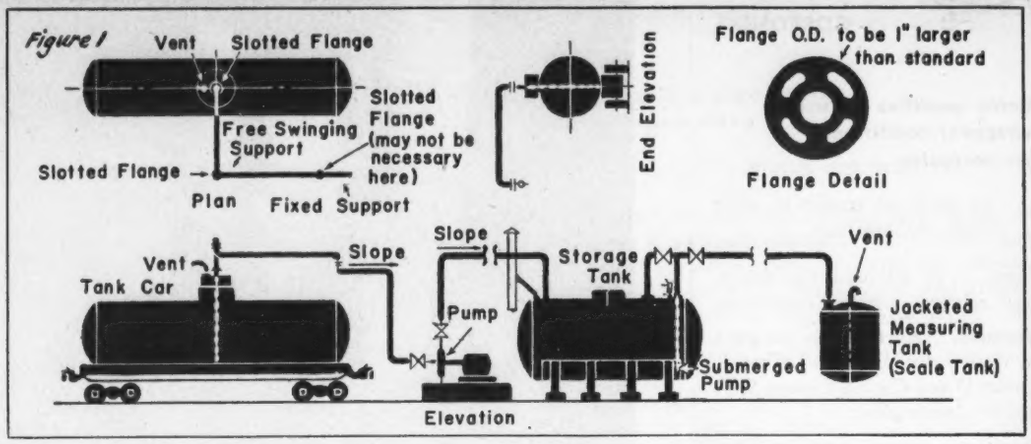
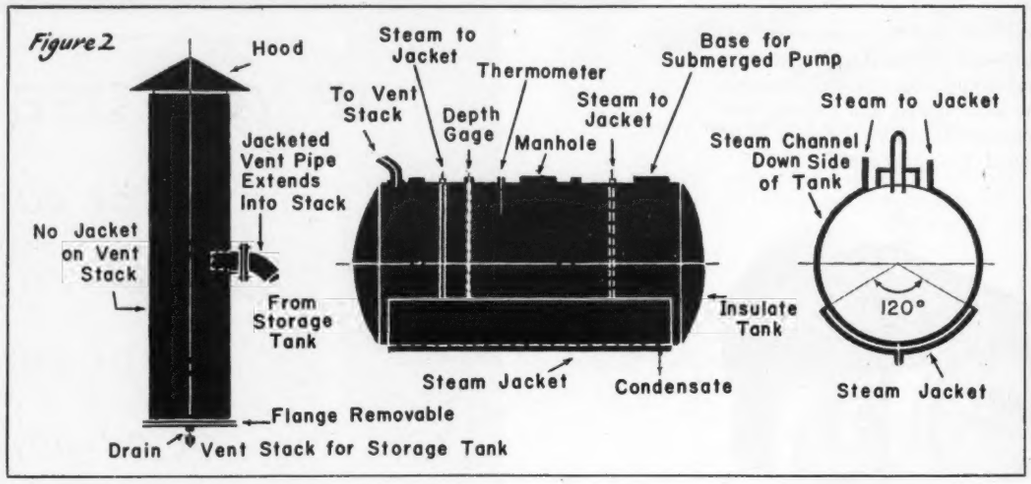
When inquiring check CP 1273 opposite last page

Figure 1



Unloading, storing, and transferring to process are easier, faster, cheaper when phthalic anhydride is handled in liquid form

Figure 2



PHTHALIC ANHYDRIDE | PUMP, DON'T DUMP

Economy of handling medium to large volumes of molten material quickly pays for tank and piping systems required for molten handling

Advantages of handling phthalic anhydride in liquid rather than powdered form are obvious; the liquid form costs less (½ cent per pound less), molten material saves processing heat and upheat time, handling costs are less, and pumping is faster than dumping.

Despite these advantages many plants have failed to take advantage of handling phthalic anhydride in liquid form because of a mistaken notion about the expense involved in converting over to the molten handling.

General Concepts

Installation for receiving, storing, and handling phthalic anhydride from tank cars and tank trucks is neither complicated nor prohibitively expensive. Basically, it consists of an insulated, steam-heated storage tank, jacketed piping in a suitable pump. Figure 1 shows general features of handling equipment suitable for phthalic anhydride.

Storage tanks, pumps, and piping should be de-

Edward Lyons, manager of Transport Service Co., examining thermometer on tank truck

(photo courtesy of Armstrong Machine Co.)

Stainless steel tank truck of the type used to haul phthalic anhydride. Lagged steam traps can be seen on either side of outlet valve

signed to avoid leakage of steam or water into the molten material. This will create a hard mass of material (phthalic acid), which cannot be remelted by steam at ordinary pressures. Careful design and construction can eliminate all danger of water leakage.

Storage tanks should be steam-jacketed, rather than internal coil-heated — to minimize possible leakage. Pipe lines, valves or cocks, and pumps should be heated by steam jackets. Steam tracing and insulation on pipes is not sufficient to heat the piping system except for small connector sections in contact with jacketed pipe. Temperature of system is controlled by adjusting steam pressure.

Materials of Construction

Molten phthalic anhydride will not corrode iron, 18-8 stainless steel, aluminum, or pure nickel. PA maintains good color and is not noticeably affected by prolonged storage at temperatures below 150°C. Above 150°C material darkens slow-

(Continued on page 128)

when **Labor-Saving** is important

in handling dry materials in bulk

. . . call on **Fuller**

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You can do a big favor for both your employees and your earnings statement by resolving to substitute Fuller conveying equipment for obsolete methods in handling dry pulverized or granular materials in bulk.

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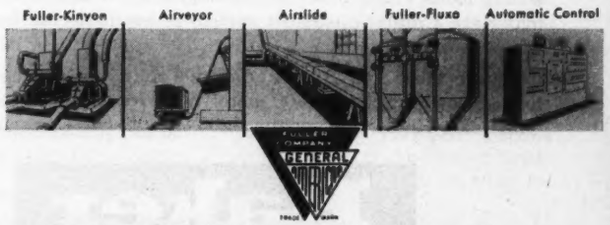
You're invited to visit Fuller at Booth 213 at the Chemical Show, Philadelphia, December 5-9



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When inquiring check CP 1274 opposite last page

new Baker

SHOVELOADER

saves up to $400 on initial cost

Now you can mechanize your bulk handling operations for less than $10.00 per day for one year . . . much less than you pay a laborer with a hand shovel!

This rugged Model 20 SHOVELOADER has a lifting capacity of 1500 pounds, and lifting height of 7 feet. Standard bucket size is 12 cubic feet. Loader arms are in *front* of operator—not around him—protecting him from injury and providing full 360° visibility at all times.

Four forward speeds with top travel speed of 14 MPH make this a *fast* machine and insure better operation on ramps and rough ground conditions.

Bucket tilt-back at ground level means a full load at every grab, and permits low carrying position for travel. Other advantages are longer forward reach, greater longitudinal stability, extremely low maintenance because of easy accessibility of all parts requiring service, and design of the husky, trial-proven engine.

Special attachments are available for special jobs—forks for palletized loads, crane hooks for hoisting, and special buckets for dense materials. Catalytic exhaust system is available for inside work, where required.

Compare these and SHOVELOADER'S many other features with loaders costing $350 to $400 more! Write for complete information. The Baker-Raulang Company, 1208 W. 80th St., Cleveland 2, Ohio.

Baker
HANDLING EQUIPMENT

55B2

When inquiring check CP 1275 opposite last page

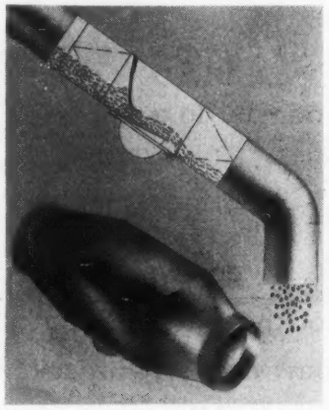
Baffle, inclined magnet catch more tramp iron in chute . . .

baffle and incline combination force close contact with magnet

Uses: Removes tramp iron from flowable granular material conveyed through incline chutes or pipes.

Features: Baffle and magnet design force intimate contact of material to magnet face providing a safety factor in tramp iron removal.

Description: Face plate of magnet is mounted to form a 7-½° angle with chute. Just before it in the chute is a flexible



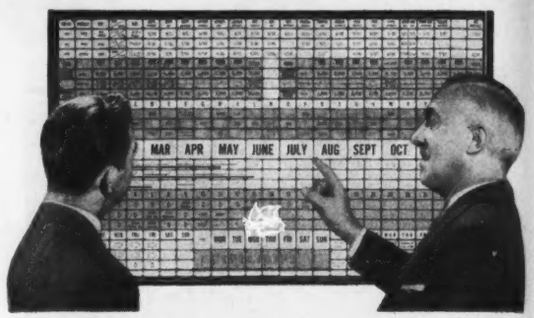
Cutaway and close-up show shape and method of installation

baffle to force flowing material to spread out and come into close contact with magnet face. All material flowing through the line comes close enough to magnet for tramp iron removal. Small ferrous particles are held to trailing edge of magnet face.

Access to magnet face is provided by its hinged door action. Magnets themselves are totally enclosed. Four magnet strengths are available in sizes to fit pipes and chutes from 4 to 16 inches.

(Permanent magnets for ducts are products of Div. B20, Columbia Engineering Service Co., Dept. CP, 4025-37 Sebastopol Hwy., Santa Rosa, Calif. . . . or for more more information check 1276 on handy form opposite last page.)

How To Get Things Done



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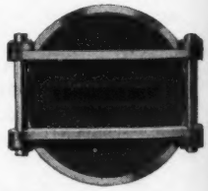
When inquiring check CP 1277 opposite last page

THE NEW LENAPE-LACY
quick opening tight sealing **MANWAY**

Remove one pin—and swing it open! Close—drop the pin in place—it's sealed!

Here is a manway that can be opened in a few seconds—yet can't open accidentally. The Lenape-Lacy design also *provides positive sealing* which seats more tightly with increasing pressure; and the molded *gasket* of Hycar or Silicone rubber can be *instantly removed and quickly replaced.* A lip protects the gasket seat from damage.

Four frame styles are available for all normal mounting conditions in sizes (ID) of 16", 18", 20", 24", and 30" in service ratings of 150 lb., 300 lb., 400 lb., and 500 lb. Also available for pressure-vacuum cycle service.



Write today for Bulletin 523 which describes the Lenape-Lacy Quick Opening Manway in detail.

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RED MAN PRODUCTS

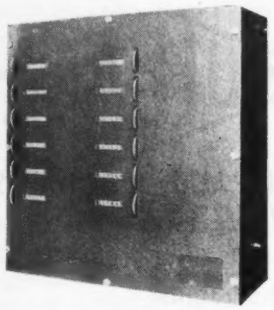
When inquiring check CP 1278 opposite last page

Converts readings of dial scale to digital equivalents . . .

remotely controlled totalizer can be used with any industrial dial scale

Uses: For converting weight readings of a dial scale to digital equivalents. Can be used with any industrial dial scale. It is especially suited for use as control in receiving or shipping and processing material to an automatic hopper scale that is connected to a dial scale.

Features: Acting as a weight totalizer with a dial-hopper scale, unit gives continuous running total-weight of batches discharged by the hopper scale regardless of how many weighings are made.



Converts analog readings of dial scale

Description: Servo unit drives totalizer. With dial-hopper scales graduations traversed by dial pointer as it moves from full load reading to zero are added up by totalizer. Weights are recorded within one graduation on dial scale. Graduation on standardized scale with 200 lb capacity is 0.2 lb.

Totalizer is only operated as pointer returns to zero. As hopper scale fills, and pointer moves from zero to full-load reading, totalizer is disengaged automatically.

In typical batching operation involving mixing of several ingredients, totalizers would be placed on centrally located control board. Various amounts of material present in mixer at any one time would be immediately read off the different totalizers.

(Totalizer is a product of Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N. J. . . . or for more information check CP 1279 on handy form opposite last page.)

Shows terminal facilities

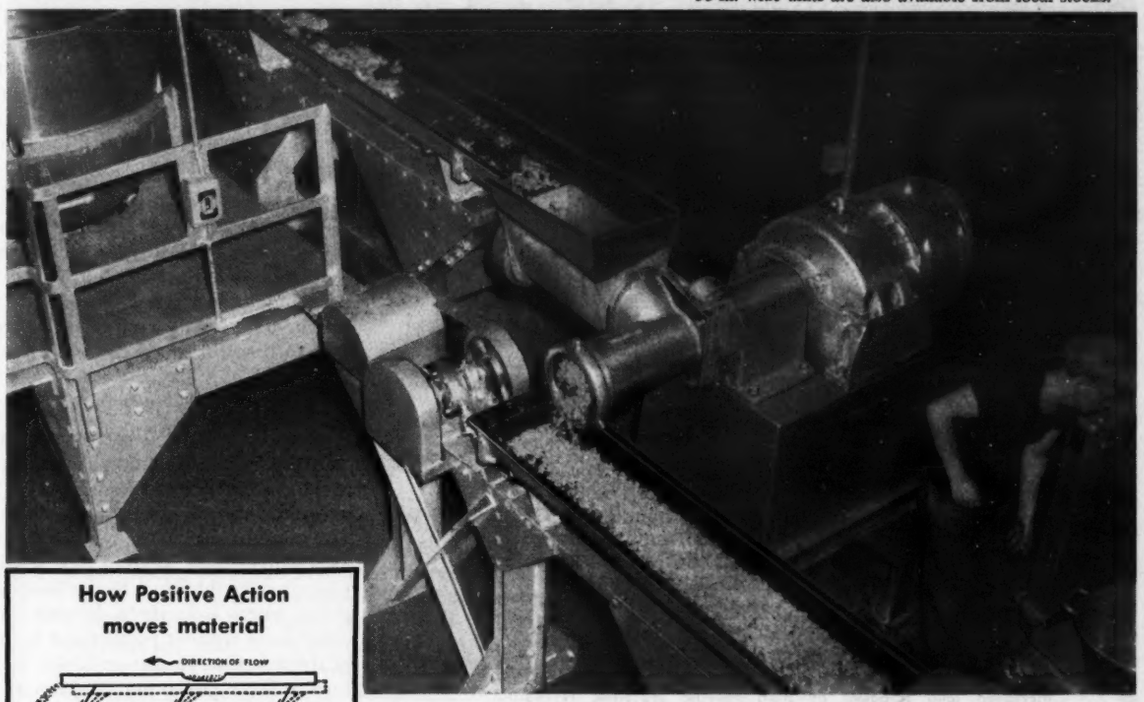
Booklet of 14 pages describes storage facilities for safe, controlled storage of bulk liquids in the New York harbor and on the Gulf Coast. Storage equipment, laboratory facilities, drumming and canning facilities, and other pertinent information is included in booklet.

Booklet "You Can Depend on Hess" is available from Hess, Inc., Dept. CP, Perth Amboy, N. J. Specify CP 1280 opposite last page.

ARRANGE YOUR OWN

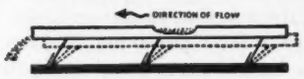
oscillating conveyor system from stock components

LINK-BELT FLEXMOUNT OSCILLATING CONVEYORS are pre-engineered — can be bought from local stocks. Standard sections of 8, 12, 18-in. widths make selection easy . . . assembly simple. Heavy-duty 36-in. wide units are also available from local stocks.



Typical of flexible arrangements possible with FLEXMOUNT is this conveyor combination carrying meat to and from a grinder. Stock sections can be built to any length desired . . . up to 100 ft. with a single motor. Dividers are available for simultaneous handling of two or more materials, and metal covers can be added for dust-tight enclosure.

How Positive Action moves material



Positive-action, constant-stroke eccentric drive provides a powerful, yet gentle upward and forward oscillating motion. Large volumes of material are moved in a uniform, continuous flow, regardless of surges. Resonant spring action of resilient legs cuts power requirements to a minimum. Only maintenance is drive lubrication.

EASY to order . . . easy to install, economical Link-Belt FLEXMOUNT conveyors are an established answer for a wide range of hard-to-handle materials. Whether pulverized, granular or lumpy . . . hot or cold, wet or dry, corrosive or abrasive—effective handling can be arranged with a minimum of engineering detail.

When your material moves on FLEXMOUNT . . . positive, jam-proof action plus safe, compact, leak-proof design provide top efficiency and capacity. And if sanitation is among your requirements, you'll welcome the ease of cleaning these conveyors.

See the versatile Flexmount at your nearby Link-Belt Factory Branch Store or Authorized Stock-Carrying Distributor, or write for Book 2478.

LINK-BELT

FLEXMOUNT OSCILLATING CONVEYORS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,904

When inquiring check CP 1281 opposite last page

PHTHALIC ANHYDRIDE HANDLING

(*Continued from page* 125)

ly on long storage and contact with any metal, and rate of darkening increases as temperature level is raised. In large tanks, where ratio of metal surface to volume of material is small, darkening is very slight.

Storage Tanks

Tanks can be placed out of doors or inside buildings. Jacketing need not cover entire storage tank. A jacket proportional to the one shown in Figure 2 provides sufficient heat for efficient melting with steam at 60 to 100 pounds gage pressure. Storage tanks should be insulated. With partial jackets, however, a device is needed for relieving pressure in the bottom of tank. Surface of materials should not be permitted to remain solid while material in bottom is being melted. Pressure can be relieved by melting an outlet from top to bottom. Design of tank in Figure 2 insures melted columns through the material.

Storage tanks should be vented. Vent pipe should be steam jacketed to prevent it becoming blocked at tank nozzle with sublimed material. Jacketed vent pipe can be extended to discharge into a large unjacketed stack as in Figure 2. Bottom flange of discharge pipe can be removed from time to time for cleaning out sublimate.

Piping

Pipe line may be constructed of standard seamless iron pipe for phthalic anhydride handling. Line should be fitted with steam jackets. Jackets should be extended very closely under each pipe section. The sections may be joined either by welding or with flanges. Butt welding pipe sections has an advantage over the usual flange joints in eliminating points where leaks could develop. Lines should be constructed without pockets and with a slight slope in the direction of storage tanks. Such drainage of lines reduces possibility of material solidifying in the lines between pumping. It also minimizes time of contact between large surface areas of metal and small volumes of material — an advantage in color preservation.

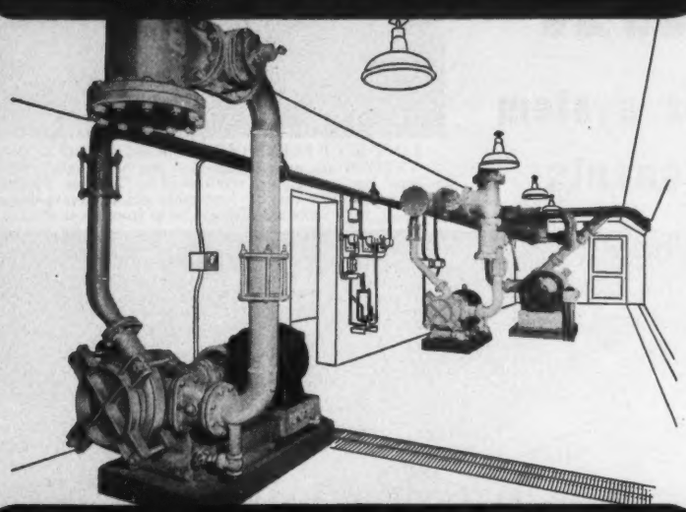
All piping should be covered with suitable insulation, including pipe joints. On outdoor lines, insulation should be weatherproof.

Suitable steam pressure for insulated outdoor line is about 40 to 50 pounds of gage pressure in warm weather and 50 to 60 pounds in cold weather. Higher pressures may be used but tend to accelerate darkening of material.

Pumps

For unloading tank cars, dry inert gas below 25 psig can be used to start flow and empty car. For moving materials to process, submerged pumps are recommended for distribution systems. Some

Handles extremely thick slurries with high specific gravities



MORRIS Type R SLURRY PUMP

Heavy viscous slurries with solids ratios as high as 70% by **weight** are not unusual loads for a Morris Type R Slurry Pump.

A case in point is this Morris installation at the Missouri Portland Cement Co., St. Louis, Mo. The two Morris 3R Pumps in the foreground each handle 200 GPM of a cement slurry at 64% solids with 1.66 specific gravity. Speed is 1180 RPM. The 6R Pump in the background handles 600 GPM of the same slurry at 880 RPM.

Long operating life... little or no maintenance

Massive running parts of the Type R compensate for the increased load imposed by high specific gravities. Hydraulic passages are deliberately designed for high concentrations of solids—the result of careful study of wear patterns shown by pumps in the field handling all kinds of abrasive materials. Elimination of areas of throttling and turbulence assures uniform wear of all parts.

There are no internal studs or bolts—no troublesome internal joints and fits. The suction disc liner is merely *clamped* into position between disc and shell. The absence of high stress on the shell permits wide variations in its composition—including materials of high abrasive resistance—to resist wear and extend the operating life of the pump.

Let our engineers consult with you on your slurry pump problems. They'll give you the benefit of 88 years of pump-building experience. Or, write for Bulletin 181.

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MORRIS *Centrifugal Pumps*

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"It's Better to Ship in Steel"

When inquiring check CP 1283 opposite last page

plants prefer to allow materials to drain by gravity from storage into a heated pump tank containing a submerged pump. Any good quality type process pump (iron) is satisfactory.

Valves should be installed at suction and discharge ends of pumps so that lines can be shut off in case repacking or repairing is necessary. Pumps should be provided with the drain cocks. High temperature graphitized asbestos has proved a satisfactory pump packing material for phthalic.

Tank Cars and Tank Trucks

Major suppliers of phthalic anhydride can supply the material in either tank cars or tank trucks. The tank cars are usually of the 10,000 gallon size (possibly 100,000 pounds) and tank trucks of 3000 gallon capacity are usually employed.

Many tank truck companies have trucks especially designed for hauling of phthalic anhydride such as Transport Service Company of Chicago, Illinois. These trucks are built to specifications laid down by the chemical companies.

Any plant using more than 200,000 pounds a month of phthalic anhydride should certainly investigate the possibility of employing the molten handling. Cost of handling varies with individual applications but a system can usually be expected to cost somewhere in the range of $30-$60,000. For major producers, this cost can be paid off in a period of two or three years. Companies like Monsanto have prepared comprehensive studies of the various factors involved in converting to liquid phthalic anhydride and have booklets available.

(Tank truck pictured in story is reproduced courtesy of The Transport Service Co., Dept. CP, 5100 W. 41st St., Stickney, Ill. . . . or for more information check CP 1284 opposite last page.)

Shows meters for use with high vp liquids

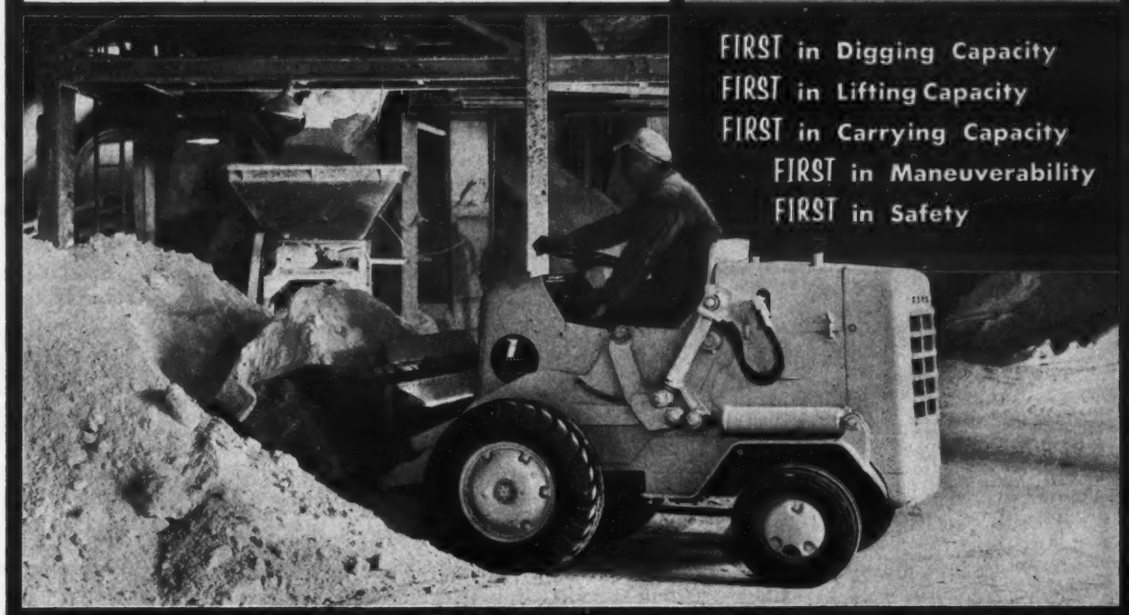
Complete line of industrial meters for suppliers of liquid propane, liquid anhydrous ammonia and liquid oxygen is described in eight-page bulletin.

Meters described include: 1) steel-cased model in sizes 1″, 1½″, 2″, and 3″ with bronze interior, aluminum piston, flow rates from 8 to 240 gpm for liquid propane service, 2) steel-cased model in ½″ to 3″ sizes with Ni-Resist chamber and piston, flow range of 1 to 140 gpm for anhydrous ammonia, 3) a bronze meter in 1″, 1½″, and 2″ sizes with bronze chamber and carbon piston, handling flows from 8 to 100 gpm for liquid oxygen services.

Bul OG 407 is issued by Meter and Valve Div., Rockwell Mfg. Co., Dept. CP, 400 N. Lexington Ave., Pittsburgh 8, Pa. When inquiring specify CP 1285 opposite last page.

FIRST in Performance
because it's
FIRST in Design

New Model HA
PAYLOADER®
Tractor Shovel
with 40 degree bucket tip-back and powerful break-out action



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FIRST in Lifting Capacity
FIRST in Carrying Capacity
FIRST in Maneuverability
FIRST in Safety

The 1955 Model HA "PAYOADER" has gone to work in all kinds of manufacturing and processing plants and has already proven that it is a production champion. It has an 18 cu. ft. bucket — the biggest capacity in its class — and an amazing new bucket action. Long-time "PAYLOADER" users as well as new owners report new highs in production and new lows in bulk-material handling costs with the new HA.

They praise the 40 degree bucket tip-back at ground level that digs heaped bucket loads easily — up to a ton in weight — and carries them close and low for fast, safe transport without spillage. They like the increased power, the ease and speed of operation that comes from torque converter drive, easy steering and powerful hydraulic brakes.

Your PAYLOADER Distributor is ready to show what the new HA can do on *your* bulk-material handling work.

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When inquiring check CP 1286 opposite last page

your plant and your workers are *Safer...*

when they use...

ALCO-LITE aluminum ladders

They're non-sparking and stronger!

These rugged ALCO-LITE Ladders are made of industrial type aluminum alloy. They are completely non-sparking and safe to use around highly inflammable materials. They can't rust, rot, splinter or burn. They're so easy to lift and handle, yet are much stronger than any wood ladder Each step is corrugated for safety and riveted to the side channels with a total of eight rivets. ALCO-LITE Ladders more than meet ASA and Metal Ladders Association standards.

for more information and your copy of NEW General Catalog write to Dept. A6

original manufacturer of aluminum ladders
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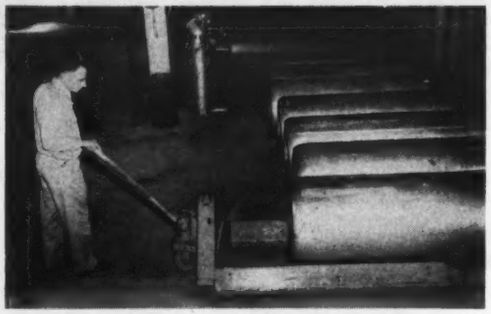
WORTHINGTON, PA.

When inquiring check CP 1287 opposite last page

Permits one-man handling of heavy cylinders . . .

use of forks 72" long in form of inverted "V" serves to cradle cylinder when forks are raised

At the Moreland Chemical Company of Spartanburg, S. C., handling cylinders 30" in diameter, 82" long and weighing more than 1½ tons is now speeded up by use of a special hand truck. Key to this operation is special forks on the hand lift pallet truck. These forks are 72" long, 9" wide and form an inverted "V" which serves to cradle the cylinder when the forks are raised.



Cylinders weighing 3500 lb are easily handled by one man at the Moreland Chemical Company using hand lift pallet trucks

To pick up load, truck is maneuvered so that forks straddle cylinder. Multi-stroke hydraulic lift raises forks four inches, cradling the cylinder and lifting it off the floor for transit.

Ball-bearing-equipped front and rear steel wheels assure easy rolling. Successful application in cylinder handling has led manufacturer to design similar truck for transporting other heavy cylindrical objects such as drums and rolls of paper.

(Model H4P Truck is a product of Yale Materials Handling Div. of Yale & Towne Mfg. Co., Dept. CP, 11000 Roosevelt Blvd., Philadelphia 15, Pa. . . . or for more information check CP 1288 on handy form opposite last page.)

Container for asphalt shipping, has one-piece construction, strips off easily . . .

American Liberty Oil Company uses drums having special release coating

Problem: The American Liberty Oil Company of Mount Pleasant, Texas formerly used a two-piece disposable "paper" drum for shipping 100 lbs of asphalt. This drum required 20 stitches for assembling. Also, the package did not strip cleanly from the cooled asphalt after shipping. Amer-

Bucket Operating Equipment for HANDLING BULK MATERIALS

This monorail hoist is especially adapted for moving bulk materials from cars to storage piles or coal hoppers and for "spotting" material at various points where required. The operator has a clear view ahead as he rides in a cab designed for inside and outside use.

Euclid Cranes are also available in a range of sizes and capacities equipped for hook operation, with magnet or bucket to handle bulk materials over a wide area.

Write for the new Euclid catalog, outlining your requirements if possible. A recommendation will then be made without obligating you in the least.

The EUCLID CRANE & HOIST Co.
1368 CHARDON ROAD
CLEVELAND 17, OHIO

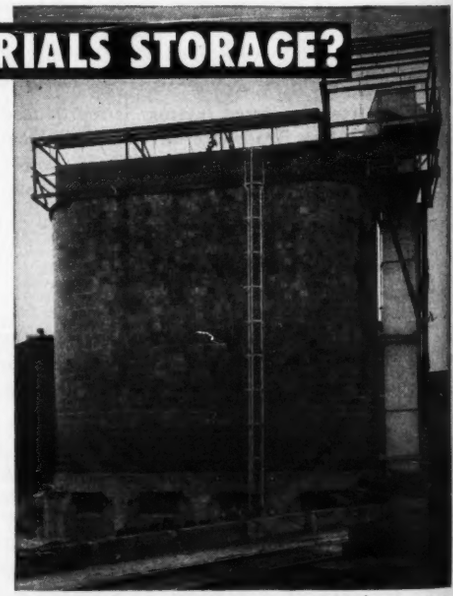
When inquiring check CP 1289 opposite last page

BULK MATERIALS STORAGE?

...here's the answer to your problems...

Kalamazoo
GLAZED TILE
INDUSTRIAL STORAGE BINS

Any shape or size engineered to meet your requirements . . . heavy, monolithic construction . . . smooth-surfaced . . . weatherproof, fireproof, corrosion-proof . . . contents protected against freezing, condensation, spoilage, contamination . . . appearance that ties in with modern industrial buildings . . . . . . long-lived.



Sand handling installation at large Ohio foundry. *Kalamazoo* design and construction provides more useable space than ordinary multiple bins.

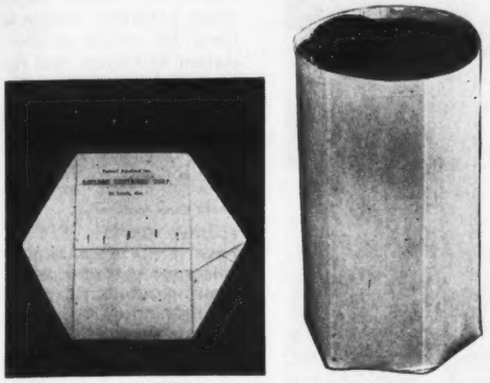
Send for complete details...

INDUSTRIAL STORAGE BIN DIVISION
Kalamazoo TANK and SILO COMPANY
1045 HARRISON STREET • KALAMAZOO, MICHIGAN

When inquiring check CP 1290 opposite last page

ican Liberty Oil wanted a package which would speed assembly and provide a quick clean strip.

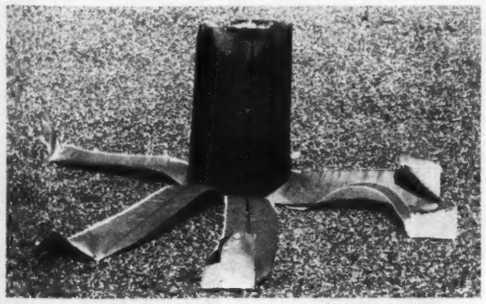
Solution: American Liberty after extensive tests, adopted a hexagonal drum approximately 13" in diameter and 23-¾" high. Material used in



Type of drum used by American Liberty Oil Co. for shipping asphalt. Wormseye view (left) shows minimum number of stitches required for closing one-piece design

drum is 30-point solid virgin kraft with a special release coating. Special heat-resistant and water-resistant glue produces an effective glue joint and release coating permits positive removal of the asphalt for use. Drum is of one-piece construction and reaches user knocked down. Instead of 20 stitches required for assembling the two-piece drum formerly used, only 3 to 5 stitches are necessary in the new package.

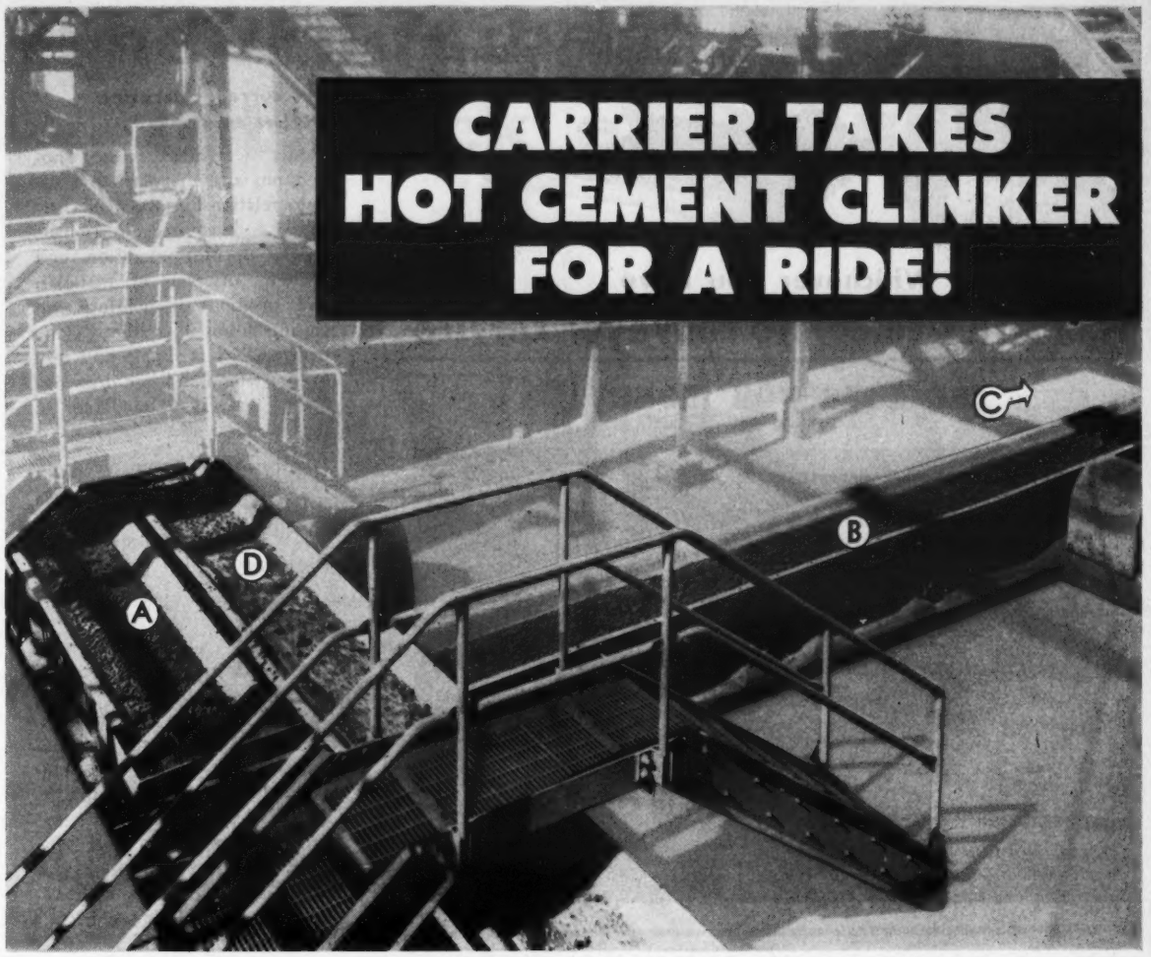
Results: New container is providing a saving in labor and materials by requiring smaller



Drum with side stripped off. Special release coating gives clean tear. Drum in this photo has top flaps

number of stitches for closing. Also new drum is somewhat lighter and this is translated into freight saving of about 20c per hundred drums.

(Asphalt container is a product of Gaylord Container Corporation, Dept. CP, 111 North Fourth Street, St. Louis 2, Missouri . . . or for more information check CP 1291 on handy form opposite last page.)



Carrier Conveyor "A" takes the clinker from coolers and feeds it at right angles onto the first of two other Carrier Conveyors "B" ("C" not shown) for delivery to a bucket elevator and storage.

Carrier Conveyor "D" also takes the clinker from coolers, but conveys it directly to a different storage pit. All four conveyors have 18" flared pans and 5HP drives, with a total length of 233'.

THAT'S hot cement clinker you see on those four Carrier Natural-Frequency Conveyors. It's being taken for a ride from coolers to two different storage pits. . . .

400° F. clinker is extremely abrasive — extremely tough to handle. Yet the Carrier Natural-Frequency Conveyors move it at the rate of 60 tons per hour with *a minimum of spillage, maintenance and downtime!*

Cement-industry applications are just one of many uses for Natural-Frequency Conveyors. Others include bulk chemicals, castings, ores, mill scale and slag, food products, machine turnings — all of which are now being conveyed and processed with spectacular success by Carrier Natural-Frequency vibrating equipment. Write for Bulletin 111. Carrier Conveyor Corporation, 237 North Jackson Street, Louisville 2, Kentucky.

CARRIER
~~NATURAL-FREQUENCY~~
CONVEYORS

When inquiring check CP 1292 opposite last page

"doodles" or complete plans?

Whichever you have

Standard's complete conveyor service can save you money!

Many a complex conveying problem has been solved by Standard engineers with only a customer's "doodle" drawing to follow. And often when complete plans are submitted, Standard engineers make recommendations that improve the conveyor application . . . save time and money as well.

If you prefer to do your own conveyor planning, we suggest you send for Bulletin 63-D. Here in 28 fast-reading pages you get all the specifications, drawing and application data on a wide range of Standard Conveyors. This includes gravity and power conveyors and accessory equipment: Handidrive pre-built conveyor units and the complete, self-contained portable conveyor units listed below.

Call your Standard Conveyor representative listed in your classified phone book — or send for copy of Standard General Catalog — address Dept. CP-105

STANDARD CONVEYOR COMPANY
General Offices: North St. Paul 9, Minnesota
Sales and Service in Principal Cities

Nearly 50 years of conveyor experience

Standard **GRAVITY & POWER Conveyors**
ROLLER • SLAT • WHEEL
SECTIONAL • BELT • CHAIN • PUSH-BAR
PORTABLE CONVEYOR UNITS:
HANDIBELT • INCLINEBELT • EXTENDOVEYOR • UTILITY BELT-VEYOR
HANDIPILER • LEVEL BELT • LITEWATE • HANDIDRIVE
PNEUMATIC TUBE SYSTEMS

When inquiring check CP 1293 opposite last page

MATERIAL HANDLING

Shows correct operation of bucket cranes

Folder of eight pages uses photographs and diagrams to illustrate relationships between preferred and required direction of bucket opening; location and contours of piles of material, and position of holding and closing drums in overhead crane trolley. Text is simple and easy to understand and line drawings make text understandable to non-technical men.

Folder 2510 is available from Blaw-Knox Co., Dept. CP, Farmers Bank Bldg., Pittsburgh, Pa. When inquiring specify CP 1294 opposite last page.

Describes dry feeders, lime slakers

Bulletin of four pages describes accurate lime feeding and complete slaking. Bulletin contains many clear illustrations and product photographs, descriptive information on dry feeders and lime slakers, and lists such advantages as rapid, thorough slaking with high-speed agitation; prevention of overheating due to thermostatic control; vapor removal devices to eliminate hot moist vapors.

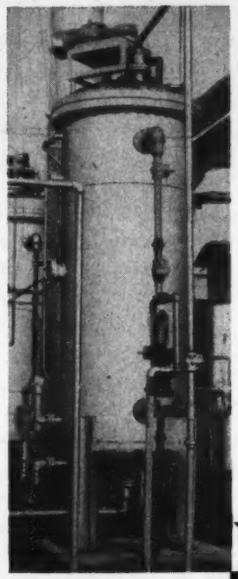
Bulletin 40-E1B is available from Omega Machine Co., Div. of B-I-F Industries, Inc., Dept. CP, 345 Harris Ave., Providence, R. I. When inquiring specify CP 1295 on handy form opposite last page.

Shows expanded line of truck scales

Bulletin shows line of truck scales ranging from 60 feet platform sizes down to axle-load scales.

Booklet 2417a is available from Toledo Scale Co., Dept. CP, 1009 Telegraph Rd., Toledo 1, Ohio. When inquiring specify CP 1296 on handy form opposite last page.

Efficient/Practical SOLVENT EXTRACTION AT *LOW* COST



The York-Scheibel multi-stage extraction column is ideal for simple counter-current extraction; and for fractional liquid extraction in which the feed material is simultaneously contacted by two selective and immiscible solvents.

Check these features . . .

- POSITIVE MIXING
- POSITIVE PHASE SEPARATION
- SINGLE, COMPACT COLUMN
- HIGH THROUGHOUT CAPACITY
- HIGH EFFICIENCY
- LOW STAGE HEIGHT
- LOW COST PER STAGE.

YORK

YORK PROCESS EQUIPMENT CORP.
4 Central Avenue
WEST ORANGE, N. J.

Complete illustrated catalog available describing laboratory, pilot plant and large scale extraction columns.

When inquiring check CP 1297 opposite last page

Treen manufactured 5-6½- and 13 gallon carboy boxes are quality built in accordance with ICC regulations, with features that give all-point protection; reducing hazards and breakage, ease in handling and compact loading.

WRITE FOR COMPLETE DATA

TREEN BOX COMPANY
TIOGA AND MEMPHIS STS., PHILADELPHIA 34

"Aces in Cases" for over 50 years

When inquiring check CP 1298 opposite last page

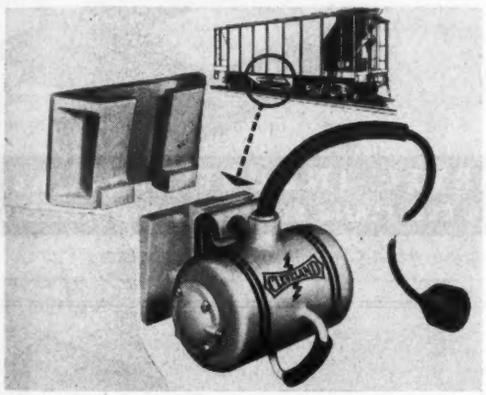
Helps speed unloading of covered hopper railroad cars . . .

vibrator employs rotary weight shaft principle — self-contained with no pulley, belting

Uses: For unloading covered hopper railroad cars. Unit can also be readily adapted for use on bins, hoppers, chutes, etc, by quick-change female bracket.

Features: Electric vibrator is self-contained with no pulleys or belting. Totally-enclosed housing seals unit from moisture and dust.

Description: Portable electric vibrator employs rotary weight shaft principle of developing vibration. It is available in voltages from 110 to 550.



Portable electric vibrator is noiseless and self-contained

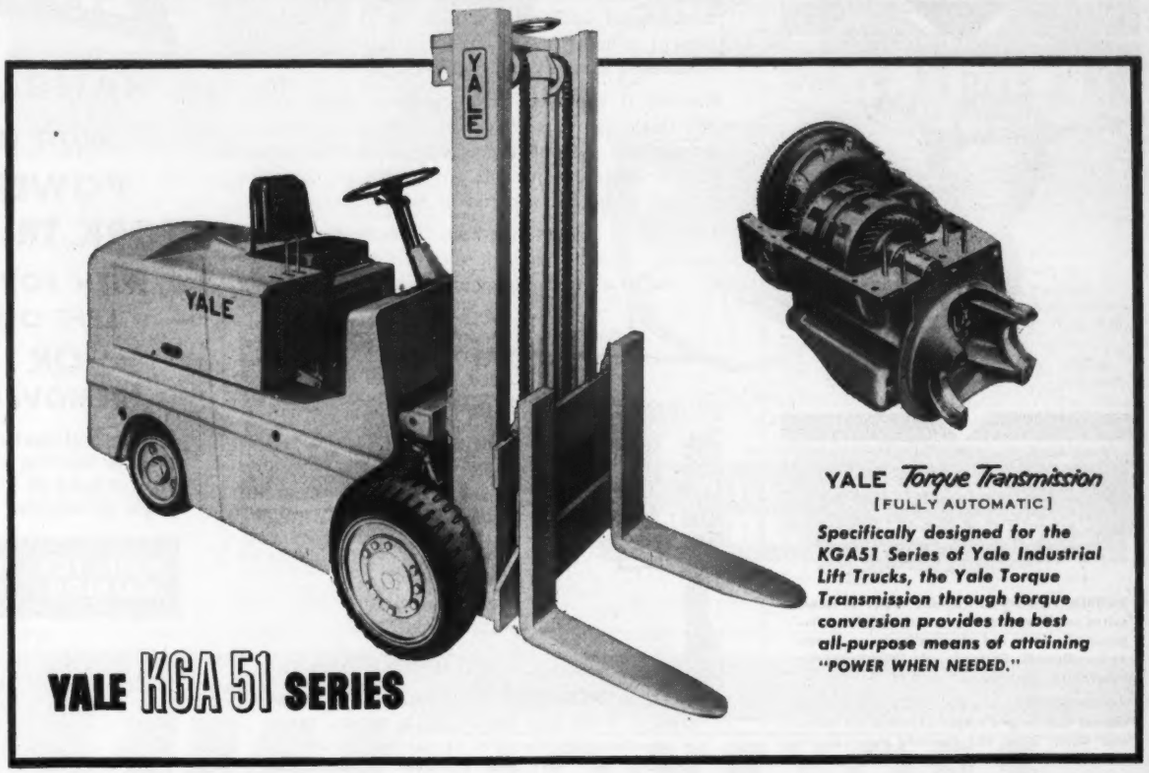
Working frequency of vibrator is 3600 pulses per minute. It is furnished ready to install and includes ten-foot cord, water-tight disconnect plugs with heavy-duty combination circuit breaker and manually-operated switch. It weighs eighty-nine pounds.

(RC-30-LSRR Vibrator is a product of The Cleveland Vibrator Co., Dept. CP, 2828 Clinton Ave., Cleveland, Ohio . . . or for more information reader may simply check CP 1299 on the convenient Reader Service slip which is located opposite last page.)

Does your plant need modern material handling methods . . . ?

check the handy Product Directory (pages 255 to 259) for a quick reference to ideas and equipment in this issue.

The smoothest handling lift truck ever built



YALE *Torque Transmission*
[FULLY AUTOMATIC]

Specifically designed for the KGA51 Series of Yale Industrial Lift Trucks, the Yale Torque Transmission through torque conversion provides the best all-purpose means of attaining "POWER WHEN NEEDED."

YALE KGA 51 SERIES

Ease and safety of a modern car . . . automatic response to power demand

with YALE *Torque Transmission*
[FULLY AUTOMATIC]

Automatic Power Control. Engineered exclusively for the KGA51 series, the YALE Torque Transmission matches power to power demand...applies the necessary power at the moment it's needed for starting or climbing grades under all load conditions.

Fully Automatic Transmission. Simplified controls increase operator efficiency, reduce fatigue. No clutch pedal or shifting of gears. Only two drive controls—accelerator and directional control lever.

Inching Control. Smoother and more accurate maneuvering of the truck is permitted at times when high engine speeds are required to perform faster lifting or for an attachment operation.

Longer Truck Life. "Cushioned Action" of YALE Torque Transmission reduces vibration and shock loading with less wear on moving parts.

Increased Operator Efficiency. Lowered cowl affords maximum visibility with operator protection. Improved safety and comfort offered by lowered seat.

Versatility. Available in capacities from 3000 to 8000 lbs.... Gas, Diesel, or LP-Gas powered...cushioned or pneumatic tires.

Gas, Electric, Diesel, LP-Gas Industrial Lift Trucks • *Worksavers*
Warehousers • Hand Lift Trucks • Hand and Electric Hoists

FREE, FACT-FILLED BOOKLET

This informative color booklet includes cut-away of the KGA51 Truck—shows why this is the smoothest handling lift truck ever built. Write: The Yale & Towne Manufacturing Company, Roosevelt Boulevard, Philadelphia 15, Pa., Dept. 1210.

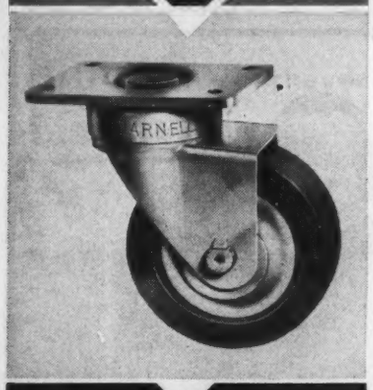
YALE*

INDUSTRIAL LIFT TRUCKS AND HOISTS

*REG. U. S. PAT. OFF.

When inquiring check CP 1300 opposite last page

DARNELL
CASTERS & WHEELS



Pre-tested for Performance

RUBBER TREADS . . . a wide choice of treads suited to all types of floors, including Darnelloprene oil, water and chemical-resistant treads, make Darnell Casters and Wheels highly adapted to rough usage.

RUST-PROOFED . . . by the Udylite process, Darnell Casters give longer, care-free life wherever water, steam and corroding chemicals are freely used.

STRING GUARDS . . . Even though string and ravelings may wind around the hub, these string guards insure easy rolling at all times.

LUBRICATION . . . all swivel and wheel bearings are factory packed with a high quality grease that "stands up" under attack by heat and water. Zerk fittings are provided for quick grease-gun lubrication.

Darnell Casters and Wheels
Always
SWIVEL
and ROLL

Free Manual

DARNELL CORPORATION, LTD.
DOWNEY (LOS ANGELES COUNTY) CALIFORNIA
60 WALKER STREET, NEW YORK 13, NEW YORK
36 NORTH CLINTON STREET, CHICAGO 6, ILLINOIS

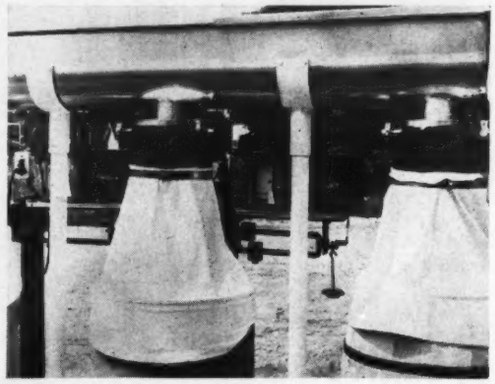
When inquiring check CP 1301 opposite last page

Speeds weighing and packaging of bulk materials

Unit has been developed to help speed weighing and packaging of bulk dry materials. It is available in units of from two sizes up to as many as may be required to handle product delivery rates.

Material is conveyed by a cadmium plated screw over discharge ports which are manually opened by the operator as container is set in place on scales. Scale beams are adjustable for weight of container and net weight of material to be discharged.

When exact amount has been discharged from the conveyor trough, magnetic mercury switch trips relay which activates solenoid, automatically closing discharge port with spring loaded gate. Conveyor screw is powered by ½ hp geared-head electric motor. Units have been constructed with up to five discharge ports. With this five-position unit each package was weighed to within ¼ lb for a 200-lb load.



Material is fed from screw conveyor to two barrels in an automatic sacker unit. As many as five different discharge units have been employed in this method of weighing

(Sacker is a product of Blaw-Knox Co., Dept. CP, Farmers Bank Bldg., Pitsburgh, Pa. . . . or for more information check CP 1302 on handy form opposite last page.)

Tells how pigment manufacturer improves material handling

Simply written, well illustrated field report shows how pigment manufacturer has improved his material handling. Report spotlights use of 4000-lb capacity fork lift truck equipped with load-grab attachment.

Report 67 is available from the Hyster Co., Dept. CP, P. O. Box 4318, Portland 8, Oregon. When inquiring specify CP 1303 on handy form opposite last page.

USE THE
LIFT-O-MATIC POWER TRUCK ATTACHMENT
for HANDLING DRUMS with a POWER FORK TRUCK
WITH FORKS LEFT ON OR REMOVED

Simple, automatic, mechanical handling of any size or type of drum—single or multiple.

WRITE FOR CATALOG
MARVEL INDUSTRIES, Inc.
2234 CLEVELAND ST., EVANSTON, ILLINOIS

When inquiring check CP 1304 opposite last page

4 NEFF & FRY CHIP SILOS

These four 30′ x 60′ silos are used by a pulp and paper mill for handling and storing wood chips.

We have erected silo-type bins at hundreds of plants to handle and store bulk materials peculiar to their industries. A few examples are—grain for the milling industry; clay, silica sand, and feldspar for the ceramic industry; ore for the metal industries; molding sand for the foundry industry; cottonseed and soybeans for the vegetable oil industry.

Designing handling and storage systems for around 100 kinds of materials has given us a wealth of experience which is at your disposal. You are invited to write, wire, or phone us.

Not exported except to Canada and Mexico

THE NEFF & FRY CO.
166 ELM STREET • CAMDEN, OHIO

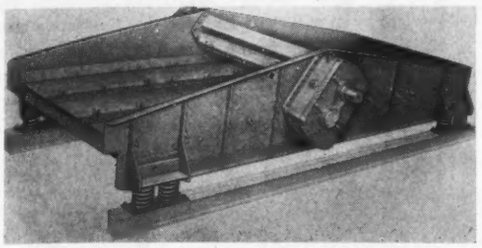
SUPER-CONCRETE STAVE STORAGE BINS

When inquiring check CP 1305 opposite last page

Allows high capacity dewatering in small headroom areas

Uses: For dewatering high-capacity loads and sizing of material where headroom is limited.

Features: Screen has two vibrators, one mounted on each side of screen at deck level for ease of inspection. Screens are available in sizes from 4 x 8′ to 2 x 20′ with either one or two decks.



Horizontal screen has low silhouette to allow dewatering and sizing where headroom is limited

Description: Vibrators do not project above sideplates, therefore headroom is held to a minimum. Center of gravity location of vibrator assures uniform straightline vibration.

(Straightline screen is a product of Link-Belt Co., Dept. CP, 307 N. Michigan Ave., Chicago 1, Ill. . . . or for more information check CP 1306 on convenient Reader Service slip which is located opposite last page.)

Have You Wondered Why —

a manufacturer's name and address appear at the end of many articles . . . ?

The "source" of editorials, which we indicate by publishing a company name and address at the end of many articles, is not "advertising" for the manufacturer. It's put there as an editorial service to help you get more information on processes, materials, ideas, and equipment which interests you.

It also helps us to decide, from your response, which subjects you want most in CHEMICAL PROCESSING. Our handy Reader Service slip, located opposite the last page, helps you to get the details you want in a hurry . . . helps us get the best stories in lining up future issues.

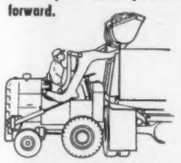
THE EDITORS

Lower tilt-back, lower carry

— loads without need for spinning wheels, travels faster

Bucket can tilt back to loosen tough materials or flip in small loads.

5" shorter turning radius (6'6"). Faster speeds to 13.88 mph in reverse, 7.66 forward.



Higher clearance (6'8"), more reach (2'7").

With the Auto-Scoop, operator can tilt the bucket back, independently of hoisting, at ground level. Can quickly loosen and load stubborn materials without undue crowding. Fast, low tilt-back also permits picking up small stockpiles, windrows. Carries low as 4½" from ground, improves stability, speeds travel. Many other advantages. Write for Catalog L12-4.

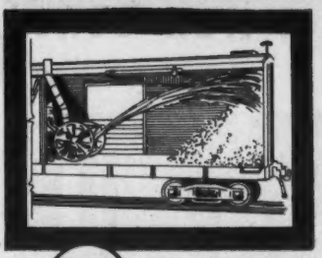
JAEGER LOAD-PLUS auto-scoop 12 cu. ft.

1 cu. yd. Load-Plus available for bigger work.

The Jaeger Machine Company
616 Dublin Ave., Columbus 16, Ohio

When inquiring check CP 1307 opposite last page

LOAD AND TRIM BOX CARS FASTER, CHEAPER.. with S-A BOX CAR LOADERS



S-A Loaders and Filers will SAVE YOU MONEY with every car you load. One man, working part-time can load and trim up to 150 tons per hour of granular material up to 2" lump size.

PRICED AS LOW AS $762.00 F.O.B. AURORA

IN STOCK... FOR IMMEDIATE DELIVERY

WRITE TODAY FOR COMPLETE INFORMATION

STANDARD PRODUCTS DIVISION
STEPHENS-ADAMSON MFG. CO.
11 Ridgeway Ave. Aurora, Illinois

When inquiring check CP 1308 opposite last page

AJAX LO-VEYORS

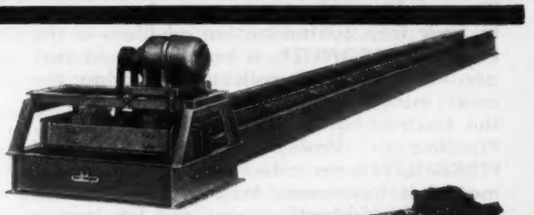
CUT COSTS CONVEYING BULK MATERIALS

Ajax Vibrating Lo-Veyors solve the problems of conveying many difficult materials in chemical processing . . . at less cost. Stringy, elongated, abrasive, fine or coarse mesh materials never hang up while being conveyed in Ajax Vibrating Conveyors.

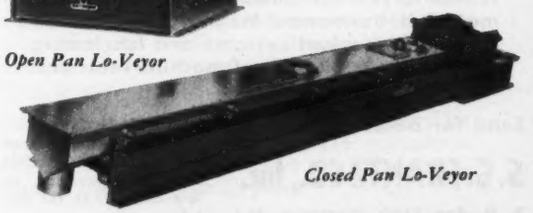
The positive upward and forward tossing action keeps materials flowing freely and evenly. Made in a wide range of sizes and lengths, they are being used from beginning to end in progressive chemical processing.

Ajax Vibrating Lo-Veyors are self-contained and require little headroom for drive and pan. They are easily and quickly installed on or below floor levels, or suspended from walls or ceilings.

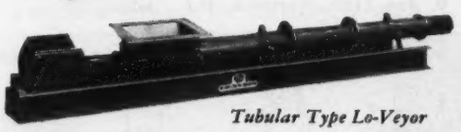
Write for Bulletin 39



Open Pan Lo-Veyor



Closed Pan Lo-Veyor

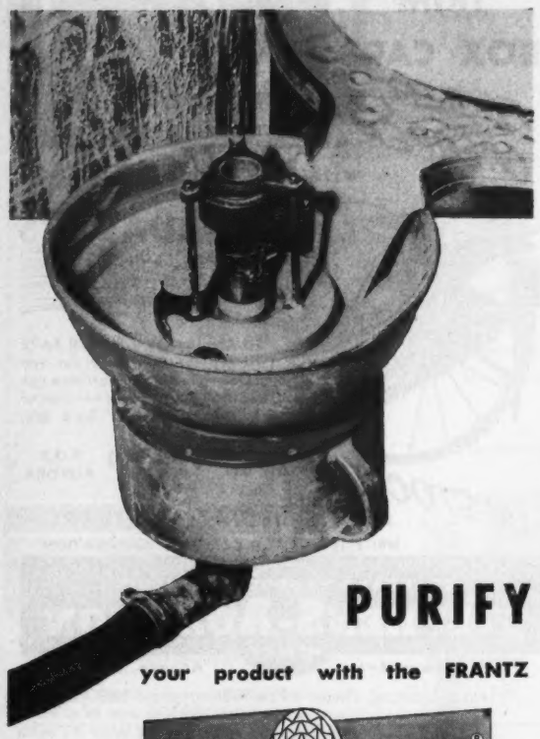


Tubular Type Lo-Veyor

AJAX FLEXIBLE COUPLING CO. INC.
REPRESENTATIVES IN PRINCIPAL CITIES
WESTFIELD, N. Y.

When inquiring check CP 1309 opposite last page

Is Iron Contamination a Problem?



PURIFY

your product with the FRANTZ

FERROFILTER®

Magnetic Separator

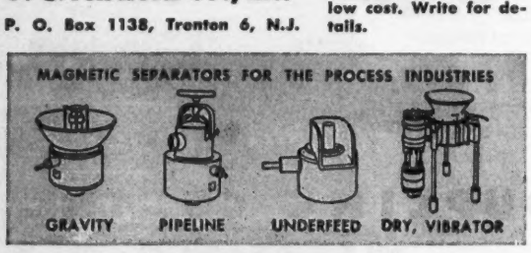
The trouble-saving, money-saving answer to your iron contamination problem is the FRANTZ FERROFILTER. It handles liquid suspensions in all viscosities, extracting the most minute iron particles. Available in the Electromagnetic Gravity type (shown), Pipeline and Underfeed types. Also DRY FERROFILTERS for powdered and granular materials; Permanent Magnet FERROFILTERS for use on coolant systems and lubricating and hydraulic oil lines of machine tools and other plant equipment.

Send for BULLETIN 46-E

S. G. FRANTZ CO., Inc.

P. O. Box 1138, Trenton 6, N.J.

RENTAL PLAN
Prove the efficiency of FRANTZ FERROFILTERS on your operation at low cost. Write for details.



When inquiring check CP 1310 opposite last page

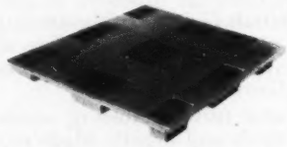
Weighs only 28 lb —supports 1.5 ton

100 plastic pallets can be nested in stack about eight feet high

Pallets nest easily, 100 can be stored in a space only 7 ft high

Weighing only 28 pounds, pallet molded of polyester resins reinforced with fiberglass can support 3000 lb of working load.

Molding pallet of reinforced plastic eliminates need for nails or fasteners which can loosen and damage a cargo. Nine hollow legs molded into platform are spaced to allow four-way approach for fork trucks.



Weighs only 28 pounds but can support 3000 pound load

Nested together, 100 of these pallets stack up to a height of only 7'8" and occupy 102 cu ft of storage space. For heavier loads, two pallets can be nested together and will support a load nearly double that which one can carry.

Strength and rigidity increase in sub-zero temperatures and pallet is not affected by rot or rust.

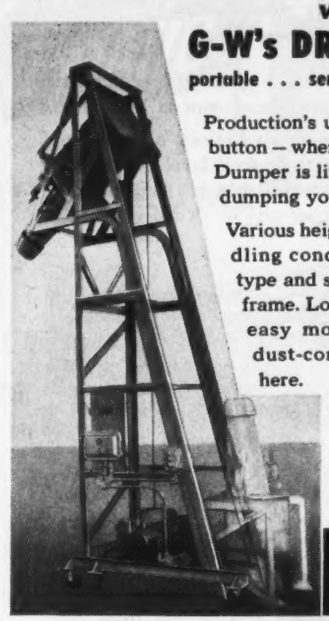
(Pallets are manufactured by Firmaline Products, Inc., Department CP, Midland Park, New Jersey . . . or for more information concerning manufacturer's product, reader may simply check CP 1311 on the convenient Reader Service slip which is located opposite last page.)

All you lift is your finger!

Production UP—costs down with

G-W's DRUM DUMPER

portable . . . semi-automatic . . . strong



Production's up—with the press of a button—when a rugged G-W Drum Dumper is lifting and automatically dumping your drums.

Various heights to suit specific handling conditions. Units for any type and size drums. Heavy steel frame. Long-life truck casters for easy moving. Available with dust-control spout, as shown here.

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When inquiring check CP 1312 opposite last page

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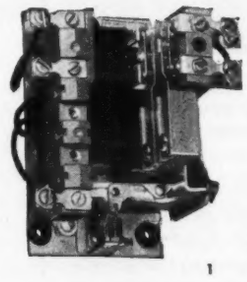

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2204 E. Maple Road, Birmingham, Mich.

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Micro-Bellows Pump

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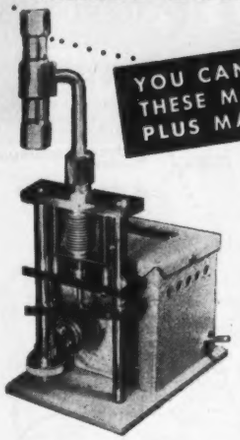

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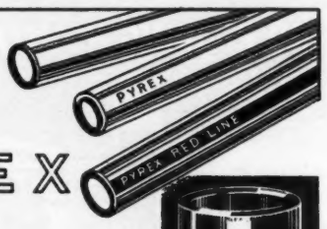

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When inquiring check CP 1315 opposite last page

Shows ways to improve packaging, carloading

Guide of 54 pages shows ways to reduce loss and damage claims, reduce container costs and speed packaging and shipping.

Shows how to apply strapping to containers, brace open-top and closed freight carloads, barricade car doorways to protect all types of packaged and bulk commodities. Also pictured are manufacturer's complete line of hand and power strapping tools and machines, strapping, seals, and accessories.

"Packaging and Carloading Guide" is issued by Signode Steel Strapping Co., Dept. CP, 2600 N. Western Ave., Chicago 47, Ill. Specify CP 1316 opposite last page.

Speeds up palletized loads in any direction

Pallet roller is constructed of heavy-gage, high-strain steel, is designed to speed up pallet handling. The swivel-type roller has a 400-lb capacity and allows movement in any direction. Dolly-type roller ranges in capacity from 2000 to 4000 lbs.

(Pallet Rollers are products of Penco Engineering Co., Dept. CP, 25 California St., San Francisco 11, Calif. . . . or for more information check CP 1317 on handy form opposite last page.)

Warehousing and storage described in catalog

Illustrated 16-page catalog shows line of steel storage equipment.

Described are racks, bins, shelves, and pallet frames. Both product and in-use photographs, general description and specifications are provided.

Catalog 702 is issued by The Frick-Gallagher Mfg. Co., Dept. CP, 110 S. Michigan Ave., Wellston, Ohio. Specify CP 1318 opposite last page.

Insist on a

ONE YEAR WARRANTY

when you buy an Electric Fork Truck

All Baker battery-powered industrial trucks—including fork, platform, crane trucks and tractors—are warranted against defects for a full year from date of shipment.

As a truck purchaser, you should accept nothing less.

A one-year warranty assures you that the manufacturer has complete confidence in the materials and workmanship that go into his product. It gives you twelve months protected operation of the truck *under your conditions*—allowing ample time to detect imperfections, which might not show up during a 30, 60 or 90 day guarantee period.

Baker Trucks have a half-century reputation for outstanding performance, long life and low maintenance. For example: a fleet of the first Baker ram trucks ever built is still in service at a large midwestern steel mill after 32 years!

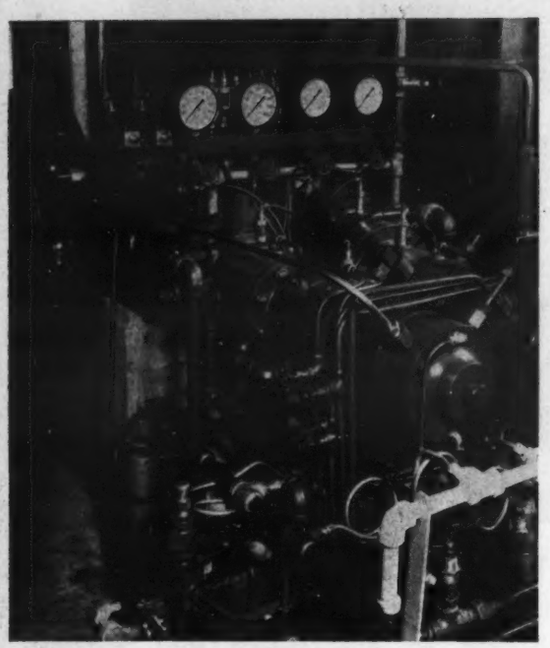
Let a Baker handling engineer give you the full story, or write for Bulletin 54B. The Baker-Raulang Company, 1208 West 80th Street, Cleveland 2, Ohio.

Baker.
handling equipment

5E3

When inquiring check CP 1319 opposite last page

NORWALK compressors in use



Six stage Norwalk compressor, used by a large university, compresses hydrogen to 25,000 pounds pressure.

Horizontal duplex construction makes this compressor compact and sturdy. Frames with taper roller main bearings, reversible ring plate valves, force feed lubrication, generous intercooler coils are some of the features (common to all Norwalk compressors) that make for efficiency and long-term economy.

Every Norwalk compressor is test-run for eight hours at the factory, then taken down for complete inspection before re-assembly and shipment. Complete catalog describing compressors from single stage to six stages available on request.

NORWALK COMPANY, INC.
South Norwalk, Connecticut

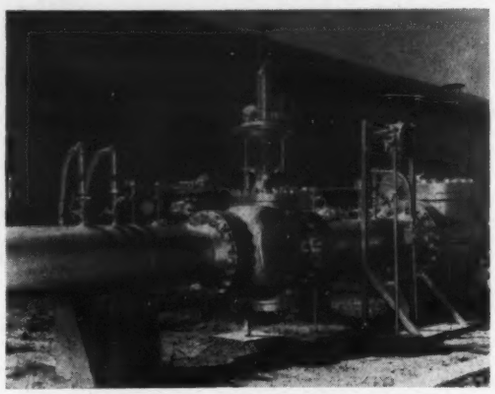
Makers of high pressure compressors for 91 years 1864-1955

When inquiring check CP 1320 opposite last page

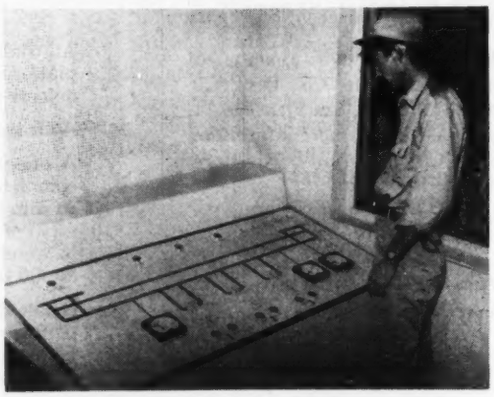
Provides semi-automatic control of oil pipeline pressure in flow . . .

use electrical pressure-sensing devices for handling crude oil at Canadian pumping stations

Semi-automatic control of oil pipeline pressure and flow by means of electrical pressure-sensing device has been provided for handling Canadian crude oil at pumping stations along the Minnesota Pipe Line



Discharge line pressure at the Little Falls pumping station of Minnesota Pipe Line Co. is measured electrically by two load cells mounted vertically above the pipe (left). One is connected through electronic amplifier to a pressure indicator and the other to a recorder-controller for automatic control of the discharge throttle valve. A third load cell, right of valve, measures station discharge pressure



Manual control panel at Little Falls pumping station includes three pressure indicators operated by pressure cells through electronic amplifiers in the cabinet below. They show station suction pressure (left), station discharge pressure, and discharge line pressure.

Company's pipeline connecting Great Northern's pipeline. This 16" pipeline connects the Great Northern Oil Company's refinery at Pine Bend, Minnesota with a delivery point 256 miles away at Lakehead Pipe Line Company, Clearbrook, Minnesota.

cut pumping costs with JABSCO INDUSTRIAL PUMPS

- INSTANTLY SELF-PRIMING
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HERE'S another Jabsco industrial pump — designed and built for chemical, pharmaceutical and other industrial applications. Ideal for transfer of various liquids and acids — sump drainage, coolant pumping, general transfer, pulp in solution, filtering, brines, plating solutions — even fluids containing foreign matter or particles, silt, crystals, and other gritty materials. Bronze, stainless steel or plastic construction is available to *solve your specific* pumping problems. Pumps either light or heavy viscous liquids. Temperature ranges from 35° to 180° F. Write for a Jabsco factory recommendation for your own needs. Specify application, fluid pumped, temperature, pressure, etc.

FREE — send for catalog sheets, detailed information... no obligation, of course!

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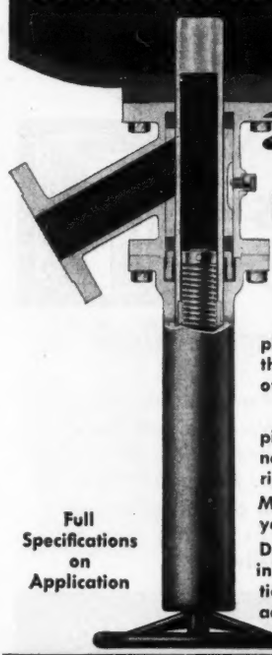

Strahman RAM TYPE Drain Valves

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In the closed position the piston or ram extends up into the tank, preventing plugging of the outlet.

In the open position with piston fully retracted, there is no resistance to flow of materials drained from the tank.

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VIBRATOR
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Literature on request.

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When inquiring check CP 1323 opposite last page

Five pressure cells, operating on the principle of the bonded resistance wire strain gage, are used at each pumping station to measure station suction and discharge pressures. Two of the pressure cells (one on suction and one on a discharge line beyond an automatic pressure control valve) are electrically connected with a recorder-controller which controls this valve pneumatically.

In each station three pressure cells are electrically connected into pressure indicators on an instrument panel. These indicators are voltmeters calibrated to read directly in psi and are operated by electronic amplifiers which convert the extremely small vibrations in the cell output into power sufficient to operate meters. Indicators show two discharge pressures (on each side of the automatically controlled valve) and the station suction pressure.

At Clearbrook, the suction pressure cell and indicator the suction pressure capacity of the cell indicator is have a capacity of 100 psi while at the booster station,

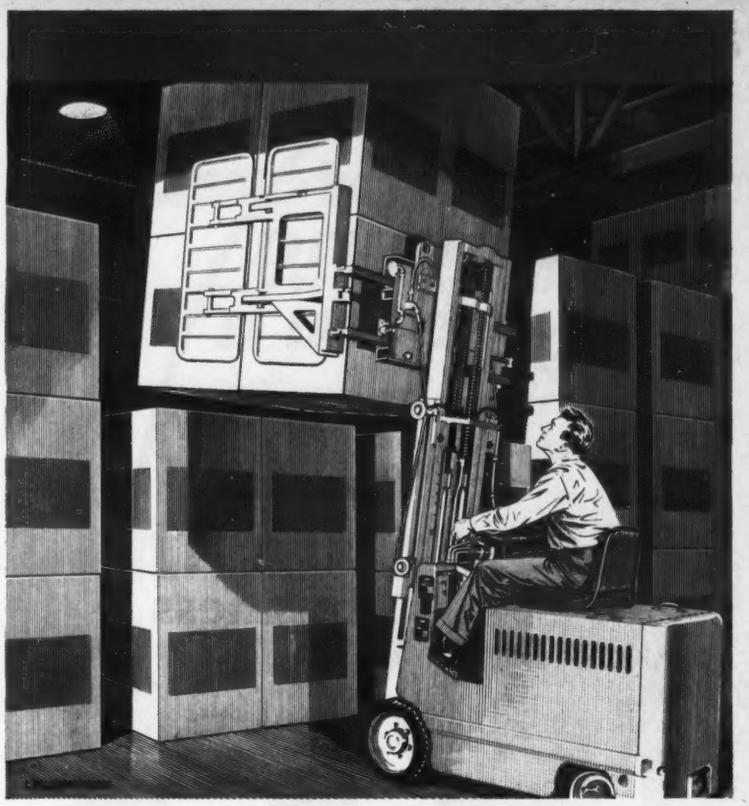
Discharge pressure is automatically controlled, taking pressure signals from two load cells: one on station suction line and one on station discharge line. The instrument records both pressures and controls the throttle valve pneumatically. Operator is setting the discharge pressure to be held

600 psi. Discharge pressure cells at both stations have capacities of 1500 psi on the station side of the control valve and 1200 psi on the discharge line.

Use of electrical pressure-sensing devices simplifies centralization of instrumentation which may be at any distance from points of measurement, and eliminates the use of hazardous and often leaky oil lines to control and instrument panels.

(Pressure cells used in system are products of Baldwin-Lima-Hamilton Corp., Dept. CP, 940 Simpson St., Philadelphia 42, Pa. . . . or for more information check CP 1324 on handy form opposite last page.)

Handy data section starts on page 248



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Rising costs are putting the squeeze on profits. One place to cut costs may be in your product packaging. A modern Gaylord corrugated box can speed packing, improve handling efficiency, reduce shipping costs and enhance customer appeal.

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When inquiring check CP 1325 opposite last page

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STAINLESS STEEL TUBING AND PIPE
Greenville, Pennsylvania

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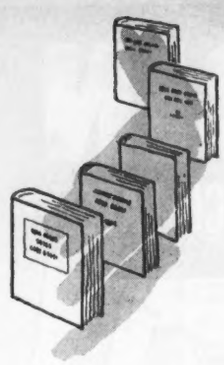
Recent Books



ASTM Proceedings

(*Staff Review*)

Latest volume of the ASTM Proceedings to be published records the technical accomplishments of the American Society for Testing Materials for the year 1954. Many of the technical reports and papers already have been printed, but the Proceedings contain much discussion that has not previously been published.

Reports of the 68 technical committees and their appendices provide much useful information. The 37 technical papers and discussions cover a wide variety of subjects relating to research and testing of materials.

In addition to the papers and reports in the Proceedings, the table of contents lists all symposiums published separately, as Special Technical Publications and all papers published in the ASTM bulletin.

To obtain ASTM Proceedings remit $12.00 *to American Society for Testing Materials, Dept. CP,* 1916 *Race St., Philadelphia* 3, *Pennsylvania.*

Instrumental Methods of Chemical Analysis

Reviewed by J. K. Owens
West Chester, Pa.

In general, Galen W. Ewing's 434-page book, which is printed on a good grade of paper, is well-written and liberally supplemented with photographs. Treatment of the various topics is sufficiently detailed so that the student grasps the methods described and the purposes for which the instruments are effective.

The chapter on polarography appears to be an excellent treatise on this subject from both theoretical and practical points of view. The chapters on chromatography and ion exchange are very limited — a surprising situation since the rest of the book is so thoroughly written.

The reader will be impressed with the vast amount of information that is available on instrumental analysis. Careful study of the book will enable him to be in the enviable position of knowing what instrument to use and how to use it.

To obtain "Instrumental Methods of Chemical Analysis" remit $6.50 *direct to McGraw-Hill Book Co., Inc., Dept. CP,* 330 *West* 42*nd St., New York* 36, *N. Y.*

Organic Solvents

(*Staff Review*)

Indexing and describing 254 organic solvents is in itself quite a project, but to tie in purification methods, properties, and references so that they are available in ready form for the reader seems even more of a job. Edited by Arnold Weissberger of Eastman Kodak Company, this second edition has been completely revised by John Riddick and Emory Toops, Jr., of Commercial Solvents Corp. These men gleaned 2147 references in preparing this monograph.

They've classified the solvents into a logical sequence and have given each a number. This number carries throughout the 552-page book and serves to make data easy to find. As a help to the reader, solvents are also indexed by boiling point, freezing point, dielectric constant, dipole moment.

To obtain "Organic Solvents (Second Ed.)," Vol. VII of a series "Technique of Organic Chemistry," remit $8.50 *direct to Interscience Publishers, Inc., Dept. CP,* 250 *Fifth Ave., New York* 1, *N.Y. When inquiring specify CP* 1327 *opposite last page.*

reviews of current technical and reference works . . . summarized for you by authorities in the field working with the CP staff

Acetylenic Compounds in Organic Synthesis

Reviewed by DR. JESSE WERNER

Director Commercial Development Department

General Aniline & Film Corporation

This compact compendium of the preparation and synthetic utilization of triple bonded (or acetylenic) compounds will be much appreciated by practicing organic chemists. A wealth of information in this interesting and ever expanding field is crammed between the covers. Included are chapters on the preparation and general properties of acetylenes, the synthesis of aliphatic compounds, conjugated systems, carbocyclic compounds and heterocyclic compounds and practical techniques. All are intended to help steer the organic chemist in the laboratory through the welter of published synthetic methods in this field.

One wishes that greater care had been exercised by the author in the presentation of the many reactions by more extensive use of sub-headings. This lack of a finer breakdown of types of reactions, the lack of an adequate table of contents for either the entire book or each chapter, and the lack of a complete index render it extremely difficult to use this book as a reference work. The section in the first chapter entitled "Nucleophilic Addition" discusses vinyl ethers, vinyl esters, vinyl amines, and vinyl amides. However, a search of the table of contents and of the index reveals no mention of these products as such.

A minor disturbing feature so far as the American reader is concerned, is the use of a modified Geneva nomenclature instead of Chemical Abstracts nomenclature. Although the author makes it quite clear that no claim is made for a complete bibliography and that selected references are given, it is still unfortunate that such valuable reviews in this field as BIOS Surveys Report No. 30 on acetylene chemistry in Germany, Schildknecht's "Vinyl and Related Polymers," and Reppe's "polyvinylpyrrolidone" are not listed. The very extensive patent literature and the PB, FIAT, BIOS and CIOS reports in this field have also been all but neglected in the references listed.

To obtain "Acetylenic Compounds in Organic Synthesis," remit $6.20 *direct to Academic Press Inc., Dept. CP,* 125 *East* 23*rd St., New York* 10, *N. Y. When inquiring specify CP* 1328 *on handy form opposite last page.*

Paint and Varnish Manual

Reviewed by G. G. SWARD

National Paint, Varnish, and Lacquer Ass'n.

This 182-page manual by Philip L. and Ruth Gordon, the fifth of a series on various subjects, is intended to acquaint the user with practices concerned with the formulation and laboratory control of paint and varnish. There are two parts: Part I comprises experiments on the preparation of oils, resins, and varnishes, used as such, or as vehicles for paints and enamels.

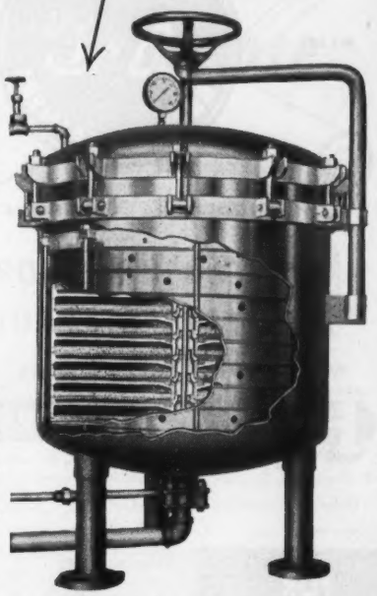
Part II deals with the paints and enamels. Each experiment contains directions for checking the quality of the product with a few key tests. Questions intended to test the student's observing power and knowledge of the reactions involved follow each experiment. The experiments are well chosen, but some of the details suggest a lapse of time between writing and publication — buhrstone mills are not modern; the few references to specifications are out of date. Also some of the details are not realistic — constant stirring is not good practice in heat-bodying of oils; two hours is a rather long baking period.

To obtain "Paint and Varnish Manual" remit $3.50 *direct to Interscience Publishers, Inc., Dept. CP,* 250 *Fifth Ave., New York* 1, *N. Y. Specify CP* 1329 *opposite last page.*

versatile adaptability

. . . for all fine filtering

SPARKLER HORIZONTAL PLATE FILTERS



Versatile adaptability make this filter the logical choice of filtration engineers for difficult filtering problems.

Every filtering job usually presents an individual problem involving a combination of various kinds of screens, papers and filter aid. Frequently temperatures are encountered that call for a brine or steam jacketed tank. Linings; plastic or rubber may be needed, with tank and plate metals to fit the product such as mild steel, monel, nickel, stainless steel, bronze or Hastelloy. Constructed to meet ASME specifications when required.

All these structural and material combinations are easily achieved with the Sparkler Horizontal Plate filter.

No fibrous adhesive material is ever required to hold the filter cake on the horizontal plate. The cake is firmly supported on the plate with no danger of cracking or slipping even with a variation in pressure or a complete shutdown in the filtering operation. The patented Sparkler scavenger plate filters almost the last drop in a batch, and allows practically a complete recovery of the product.

Constant filtering quality is maintained from start to the end of the cycle, no break through can occur in a Sparkler Horizontal Plate filter.

What other filter can match this versatility and positive performance under a wide variation of filtering conditions?

Place your filtering problem in the hands of our filtration engineers. They have developed many successful methods of filtering difficult materials and may be able to prescribe a solution to your problem without wasteful experimentation.

Write Eric Anderson for personal attention

SPARKLER MANUFACTURING COMPANY

MUNDELEIN, ILL.

Canadian Plant, Galt, Ontario

European Plant, Amsterdam, Holland

For over a quarter of a century, engineers and manufacturers of a complete line of industrial filtration equipment.

When inquiring check CP 1330 opposite last page

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Factories — St. Louis, Mo.; Rittman, Ohio; Turner, Kansas; Arlington, Texas.

When inquiring check CP 1331 opposite last page

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FISCHBEIN Portable BAG CLOSER

- A *truly* portable bag closer . . . Weighs only 10½ pounds.
- Requires no installation . . . plug into any outlet.
- Handles textile and paper bags.
- Simple to operate and maintain.
- Lowest priced bag closer on the market.

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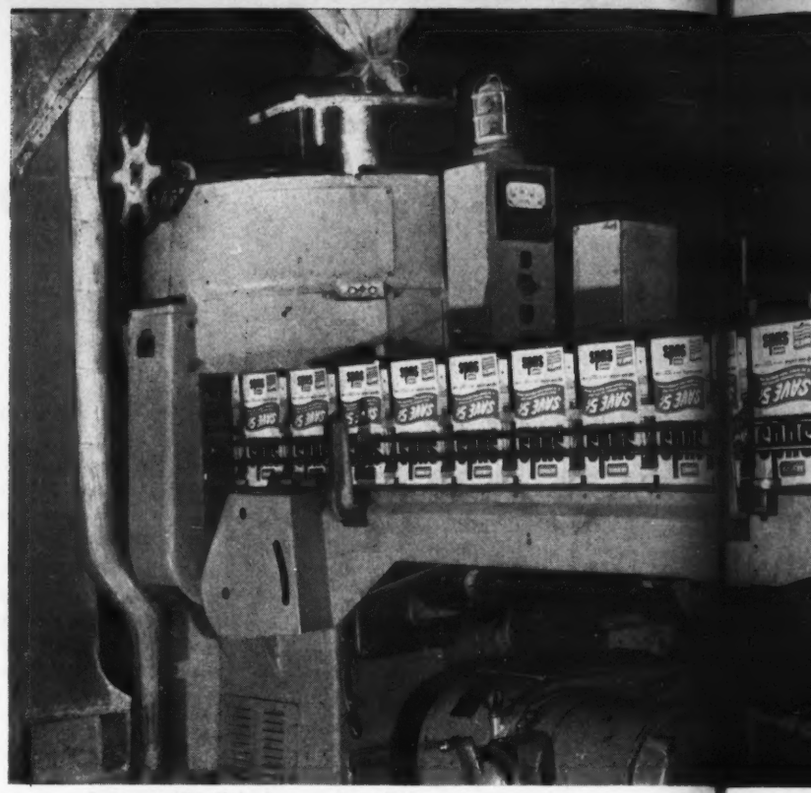
When inquiring check CP 1332 opposite last page



Detergent filler (left) has max rate of 300 cartons per minute

By **ROY G. HELSING,** Assistant Editor
With **J. W. PENDORF,** Div. Engineer Armour Auxiliaries
and **J. V. WILKERSON,** Superintendent Soap Division
Armour & Company, Chicago, Ill.

CP Staff Photos

More uniform fill plus cleaner operation were added values gained by Armour & Company when they —

increased detergent filling by 200 units per minute

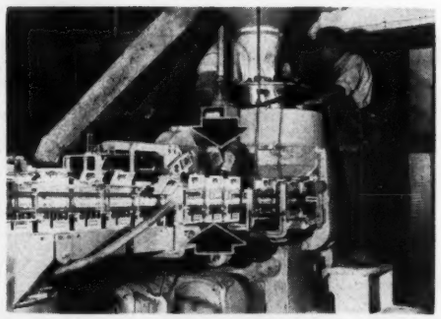
Machine now in operation has "no carton, no fill" feature and an automatic reject for under- or over-fills

Problem: Machine formerly used at Armour & Company, Chicago, to fill synthetic detergent, did not adequately serve the purpose. Filling speed was 50 cartons a minute. Constant spot-check of filled weights and adjustment of machine was necessary to maintain accurate fill. Furthermore, the unit discharged detergent whether a carton was in place or not. This made good housekeeping a problem, and increased maintenance of machinery, since detergent powder tends to clog and break down operating parts.

Solution: In 1953, Armour installed a high-speed volumetric filler. This unit has a maximum filling speed of 300 cartons per minute. It also incorporates an automatic carton feed, a "no carton, no fill" feature, an electric-eye volume-checker (with automatic reject for under- or over-fills), and an automatic carton sealer and compression unit.

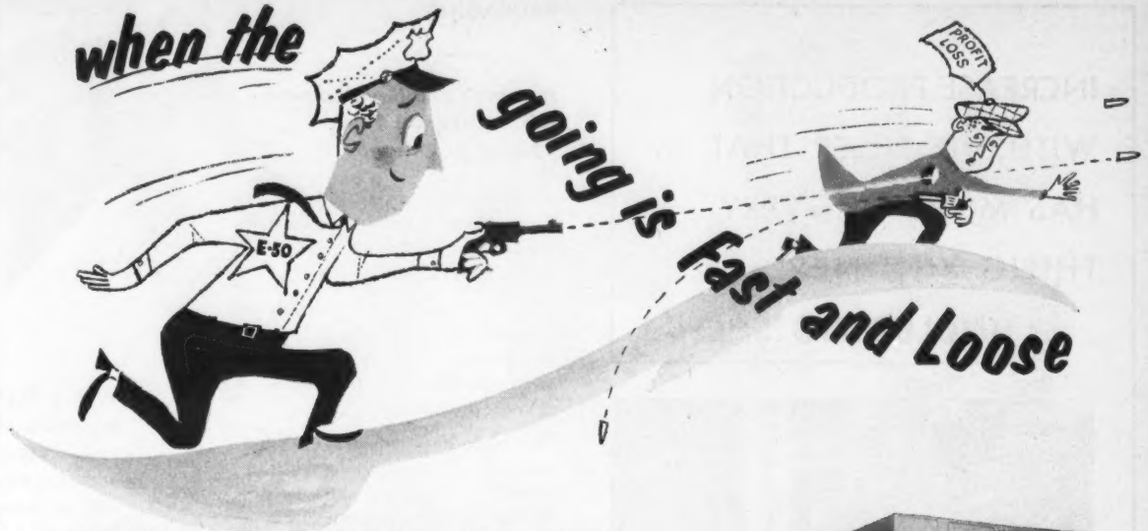
To handle this production, Armour integrated with the carton discharge conveyor a case-packer, which takes the detergent cartons at the normal 250/min rate and packs three 8-carton rows per case, semi-automatically. This case packer feeds to an automatic case sealer, which discharges onto a

(*Continued on page* 145)



Electric-eye volume-checker (top arrow) and automatic reject (bottom arrow) have eliminated spot-checks and constant machine adjustment. Carton flaps are glued in attachment at left of reject

Semi-automatic case packer easily handles 250/min carton production. Packs three 8-carton rows per case



YOU CAN DEPEND ON THE Richardson E-50!

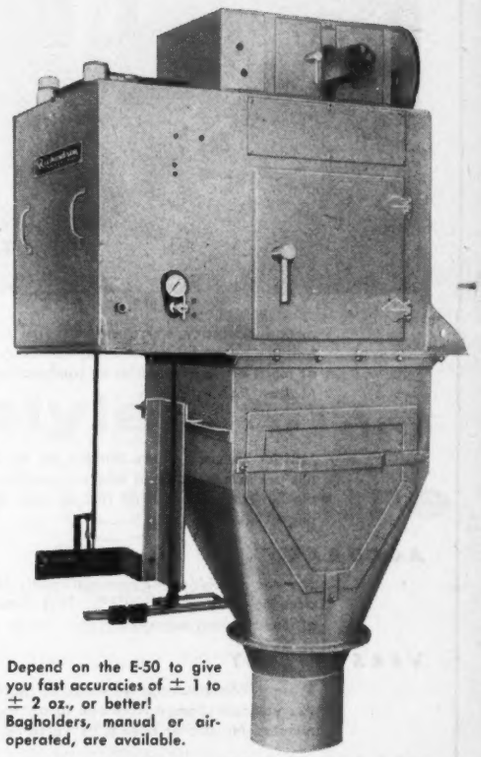
When the weighing is fast and the materials are loose (or even sluggish!), and you're having a running battle with profit loss from weight inaccuracy or the high cost of bagging and scale upkeep . . .

here's one scale that won't let you—or your profits—down!

IT'S DEPENDABLE! The E-50's work-horse dependability makes it the perfect choice for any plant *where output vitally depends on the perfection of the bagging scale.* And upkeep is low! You'll find Richardson Scales still in operation after 30 and more years of service.

IT'S FAST, ACCURATE! With the rugged, completely automatic Richardson E-50 you'll get high speed bagging with accuracies *that never before were a practical possibility*—up to 1/10 of 1% under optimum conditions.

IT'S VERSATILE! Unique design permits the weighing of hundreds of food, chemical, grain and other materials. The E-50 is equally efficient as an independent bagging machine, or as an integral part of a co-ordinated production line packaging system. Don't let weight inaccuracy and bagging costs pick your pockets. Find out about the scale that really unties production tie-ups—Richardson E-50. Write today for free illustrated bulletin #3749A that tells the whole cost-saving E-50 story!



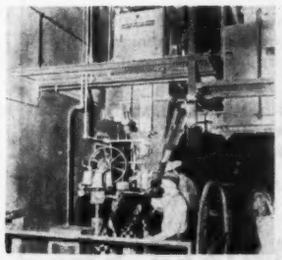
Depend on the E-50 to give you fast accuracies of ± 1 to ± 2 oz., or better! Bagholders, manual or air-operated, are available.

Richardson

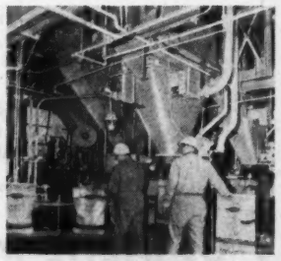
1720 MATERIALS HANDLING BY WEIGHT SINCE 1902

RICHARDSON SCALE COMPANY • Clifton, New Jersey

Atlanta • Boston • Buffalo • Chicago • Cincinnati • Detroit • Houston
Memphis • Minneapolis • New York • Omaha • Philadelphia
Pittsburgh • San Francisco • Wichita • Montreal • Toronto • Havana
Mexico City • San Juan



Duplex Model E-50 bags poultry mash up to twenty-two 50-lb. bags per min. at leading feed mill.

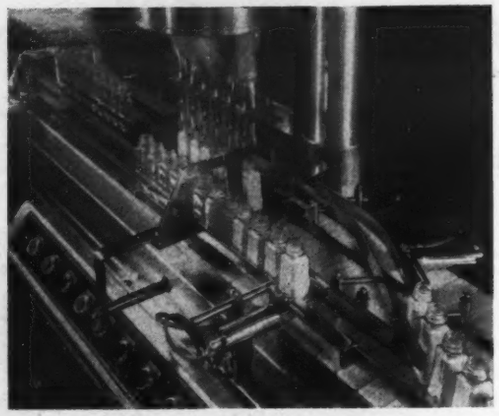


Ten 50-lb. bags per min. of antibiotic are delivered from Duplex E-50 in major pharmaceutical plant.

When inquiring check CP 1333 opposite last page

INCREASE PRODUCTION WITH THE FILLER THAT HAS MORE OF EVERY-THING YOU NEED...

INCLUDING SPEED!



Speed, accuracy, versatility, ease of maintenance . . . *no filler on the market today has as much of these qualities in combination as Mateer. For instance—*

SPEED

Mateer Electric Fillers handle up to 240 fills per minute . . . and where powders are concerned are *twice as fast as any other auger filler!*

ACCURACY

Mateer precision engineering results in an accuracy rating of 99.7%. *That kind of efficiency saves money!*

VERSATILITY

Mateer Fillers handle all kinds of material . . . you can change from one to another in minutes. No similar filler is as versatile.

CLEANLINESS

Mateer Fillers handle sterile materials, and under the most rigid specifications. All standard parts are approved for aseptic filling.

MATEER MODELS INCLUDING MANUAL, SEMI-AUTOMATIC AND FULLY AUTOMATIC ARE CUSTOM ENGINEERED TO YOUR SPECIFIC NEED

Send for our latest brochure—How Modern is Your Filling Equipment? Write Dept. C.

G. DIEHL MATEER CO.
Lincoln Highway, Strafford, Wayne, Pa.

When inquiring check CP 1334 opposite last page

PACKAGING

Research and development lab for aerosol filling opened in Chicago

An expanded research and development laboratory, largest in the aerosol filling field, was recently opened by G. Barr & Co. of Chicago.

This expansion makes possible an extension of the research, product development and quality control services offered to distributors of aerosol products.

The laboratory concerns itself primarily with product formulation, including development of new aerosol products, reformulation of existing products for aerosol packaging, and the testing of raw materials and product specifications.

Company does not market any products under its own label. All results of its product research are produced on behalf of customers.

Company's basic research also is being expanded. Studies now being conducted in the laboratory include several on the corrosion of containers, and on evaluation of resins.

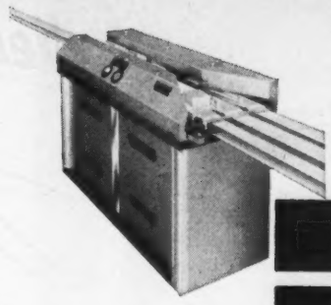
(Development laboratory of the G. Barr & Co. is located at 3601 S. Racine Ave., Chicago, Ill. . . . or check CP 1335 opposite last page.

Labeler goes on bench, takes round objects

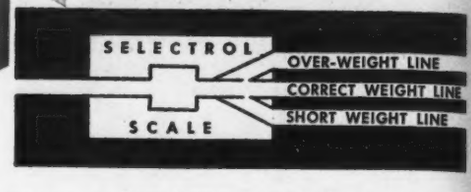
Fully-automatic, high-speed labeler for wide range of round objects is described in two-page data sheet. Designed for handling containers with diameters to 1-7/16", machine is capable of applying part-around labels, full-around labels, and flag labels without adjustment of labeling mechanism.

Bench model labeler will handle between 50 and 120 tubes, vials, or small bottles/min.

Bulletin on The Jagenberg, German-built, Bench-roto-Labeler is available from Alfred Hofmann and Co., Dept. CP, 635 Fifty-ninth St., West N. Y., New Jersey. Specify CP 1336 opposite last page.



SELECTROL weighs, sorts and counts EVERY package



With a SELECTROL in your package line you eliminate the inaccuracies of spot checking, prevent losses from overweight packages. Packages are weighed in motion — no spilling. Rejection accuracy can be held to one gram, plus or minus at speeds up to 100 per minute. Investigate time, labor and product savings possible with a SELECTROL. Write for complete details.

Sales and Service Coast to Coast

Exact Weight Scales

Better quality control
Better cost control

THE EXACT WEIGHT SCALE COMPANY
905 W. Fifth Avenue, Columbus 8, Ohio
In Canada: P.O. Box 179, Station S, Toronto 18, Ont.

When inquiring check CP 1337 opposite last page

METAL FABRICATING

better by LITTLEFORD

Nickel pipe fabricated for the chemical industry

More accurate and faster metal fabricating is yours at Littleford . . . because (1) our engineers work closely with your engineers. (2) 175,000 sq. ft. of modern plant and equipment are devoted to the production of your tanks, bins, vats, troughs, carts, ducts and special units. In addition, you get the advantage of over 73 years experience in metal fabricating including stainless steel, aluminum, nickel and monel. For prompt estimates, send your blueprints to Littleford Bros., 417 E. Pearl St., Cincinnati 2, Ohio.

When inquiring check CP 1338 opposite last page

FASTER DETERGENT FILLING

(*Continued from page* 142)

conveyor from which cases are removed for storage or shipment.

Results: As well as increasing their detergent production rate by 200 cartons per minute, Armour has also found that this unit gives a more uniform, accurate fill. "No carton, no fill" feature has improved housekeeping and reduced maintenance. Automatic volume check and reject of improperly filled cartons has eliminated need for spot-check of cartons and constant machine adjustment.

Three operators are required for this unit: one to place empty cartons into automatic carton feeder, one to oversee filling operation, and one to case cartons.

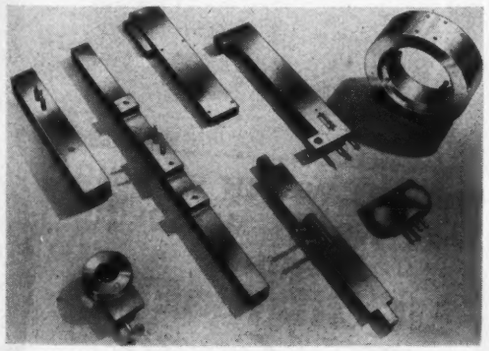
("Neverstop" high-speed carton filling and sealing machine and accessories are products of Stokes & Smith Company, Dept. CP, 4992 Summerdale Ave., Philadelphia 24, Pa. . . . or for more information check CP 1339 opposite last page.)

(Semi-automatic case packer and automatic case sealer are products of Standard-Knapp, Div. of Emhart Mfg. Co., Dept. CP, Portland, Conn. . . . or check CP 1339A opposite last page.)

Tough plastic sealing jobs handled by custom-built cast heaters

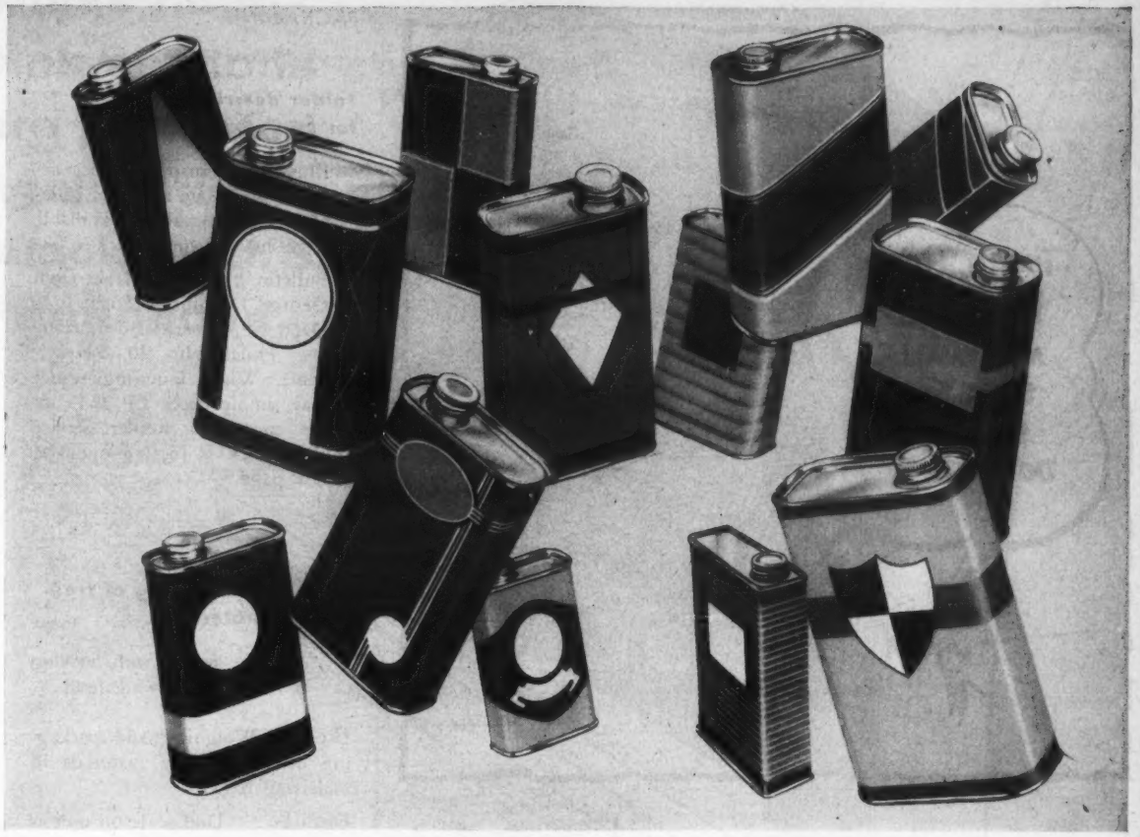
Uses: For heat sealing machine bars.

Features: Heaters are said to provide the answer to "tough" plastic sealing jobs on Saran, vinyl, polyethylene and other thermo-plastic materials.



Description: Units are cast in any size or shape in aluminum or aluminum bronze. They are custom-built to meet individual requirements.

(Cast "Thermaheaters" are products of Thermel, Inc., Dept. CP, 3440 W. Lake St., Chicago 24, Illinois. Check CP 1340 opposite last page.)



Continental "F" style cans forecast a sunny future

Today, almost every producer of waxes, polishes, oils, etc., packages in "F" style cans. With Continental "F" styles, however, you can look forward to more than sturdiness and convenience. Colorfully lithographed by master craftsmen, these rugged containers give your product a bright competitive edge on crowded supermarket shelves.

In addition, Continental spares no effort to make Tailor-Made Package Service as appealing as "F" style cans themselves. Whatever size you choose, from four-ounce to gallon, we'll deliver just the quantity you want, just when you want them. And like our packages, research and engineering tailored precisely to your needs are always available.

Let us show you the sunny sales future that "F" style cans offer your chemical products. Call anytime.

CONTINENTAL CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4

When inquiring check CP 1341 opposite last page

Bemis Multiwalls made with RUF-GRIP kraft handle easily . . . and stack easily . . . and stay stacked. Consequently, they ship and store better. Get the details from your Bemis Man.

* TRADE-MARK

Also in the Bemis Family, Serving the Chemical Industry . . .

Waterproof (Laminated) Bags

Bemis

General Offices—St. Louis 2, Mo.
Sales Offices in Principal Cities

When inquiring check CP 1342 opposite last page

PACKAGING

Folder describes cans for many uses

Illustrated four-page folder describes range of sizes and styles of metal containers available from manufacturer.

Bulletin 57A is available from George D. Ellis & Sons, Inc., Dept. CP, American & Luzerne Sts., Philadelphia 40, Pennsylvania. When inquiring reader may simply check CP 1343 on the convenient Reader Service slip which is located opposite last page.

High-speed bagging of free-flowing materials . . .

machine works with moving conveyor and sewing head

Uses: Weighing and packaging of free-flowing materials in multiwall bags.

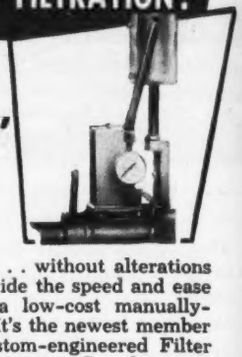
Features: Dial scale on unit is double-faced so that both closing and filling operators can see it at all times. A system of switches within reach of bagging operator enables him to change weight units immediately by operating switch covering desired unit. Machine weighs units from 25 to 200 lb.

Description: Machine works in conjunction with a moving conveyor and sewing head. Weighing and filling cycle is completely automatic. It begins when operator pushes starter button. This automatically delivers pre-weighed material through the machine's bag chute in an endless series. Filled weight drops each of the open mouth multiwall bags on a moving conveyor belt which leads them through the sewing head.

(Inglett & Corley bagger, Model UB-101, is a product of Union Bag & Paper Corporation, Department CP, 233 Broadway, New York 7, New York . . . or for more information concerning manufacturer's product, reader may simply check CP 1344 on the convenient Reader Service slip which is located opposite last page.)

INSTALLS IN MINUTES!
OPERATES IN SECONDS!
DELIVERS YEARS OF
MORE EFFICIENT FILTRATION!

New
SPERRY "HANDRAULIC" FILTER PRESS CLOSING DEVICE



Replaces the filler block . . . without alterations or extra space . . . to provide the speed and ease of **hydraulic** control in a low-cost manually-operated Closing Device. It's the newest member in Sperry's family of custom-engineered Filter Presses and auxiliary equipment. See the complete line in Sperry's big new catalog. Send for your free copy today.

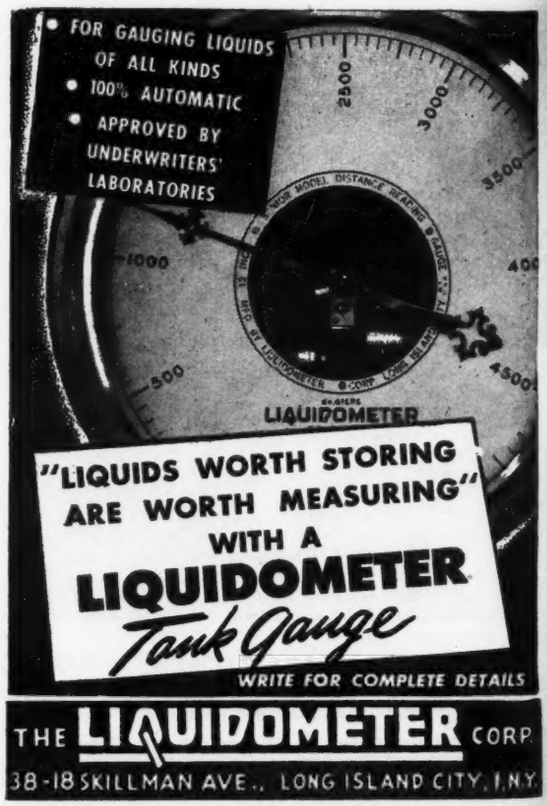
Eastern Sales Representative: George S. Tarbox, 808 Nepperhan Ave. Yonkers 3, N. Y. Yonkers 5-8400

Western Sales Representative: B. M. Pilhashy, 833 Merchants Exch. Bldg., San Francisco 4, Calif. DO 2-0375

SPERRY FILTER PRESSES

D. R. SPERRY & CO., BATAVIA, ILL.
Filtration Engineers for More Than 60 Years

When inquiring check CP 1345 opposite last page


FOR GAUGING LIQUIDS OF ALL KINDS
100% AUTOMATIC
APPROVED BY UNDERWRITERS' LABORATORIES
LIQUIDOMETER
"LIQUIDS WORTH STORING ARE WORTH MEASURING" WITH A
LIQUIDOMETER Tank Gauge
WRITE FOR COMPLETE DETAILS

THE LIQUIDOMETER CORP.
38-18 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

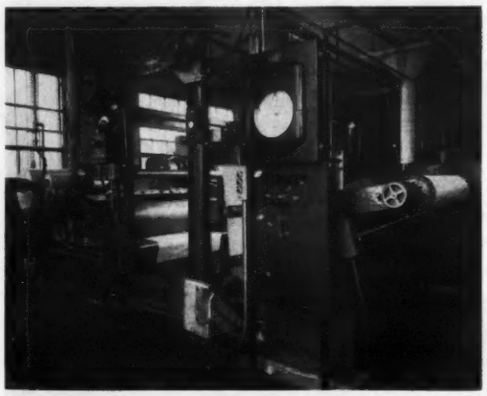
When inquiring check CP 1346 opposite last page

Bonds polyethylene to paper and foil

Extruder-laminator reduces pellets to variety of flexible packages

Polyethylene extruder-laminator just installed at the Rap-In-Wax Paper Company allows them to produce a variety of flexible packages.

Machine bonds polyethylene plastic to all types of paper and foil. Pellets of polyethylene subjected to extreme heat and pressure, can be made into almost any finish — from high gloss to mat types. Machine produces sheets of laminated packaging material up to 48" wide.



Extreme heat and pressure reduce polyethylene pellets into moldable consistency for bonding to paper or foil. Polyethylene extruder-laminator in use at Rap-In-Wax Company is shown producing flexible wrapping for frozen foods

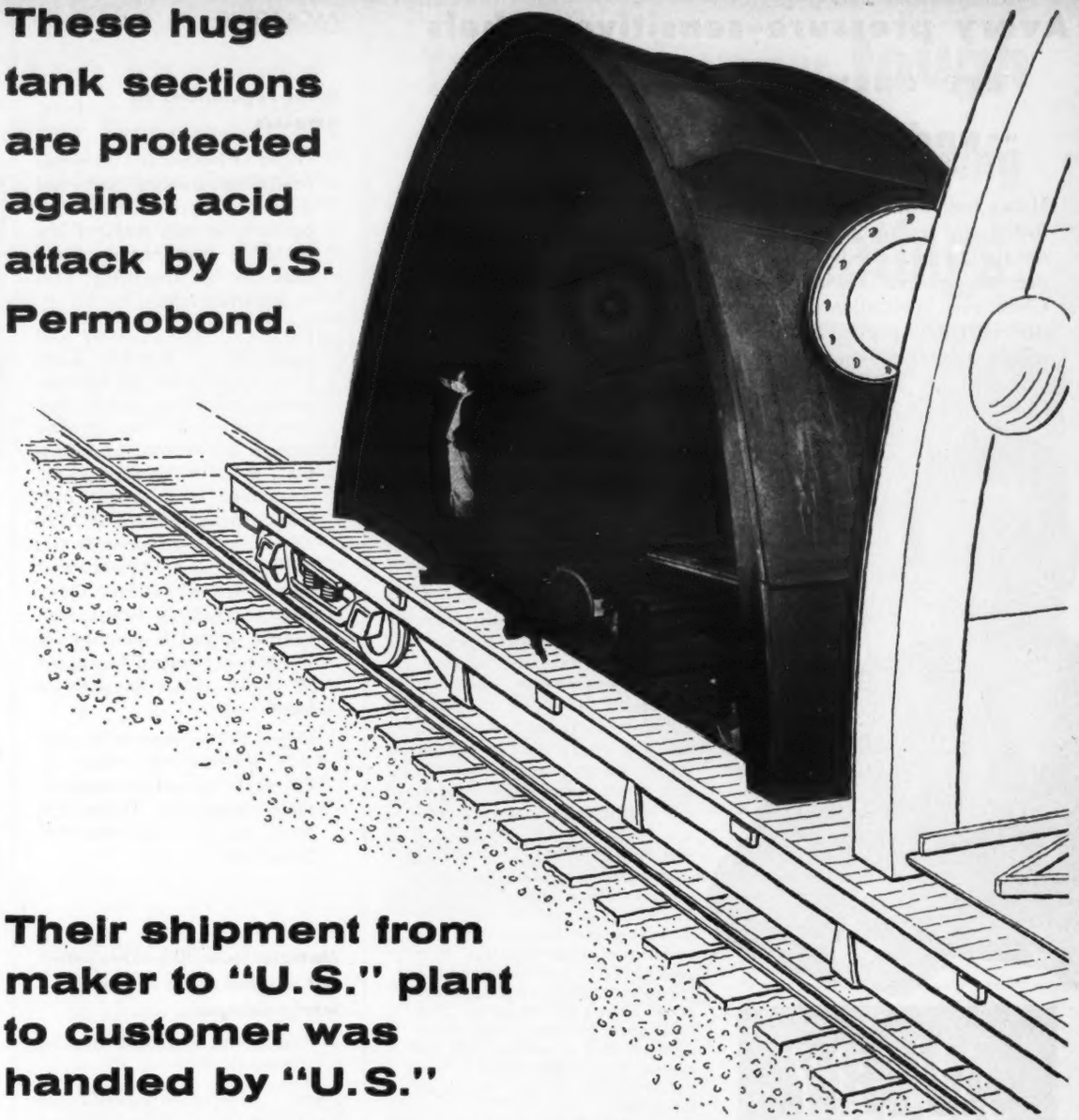
(Polyethylene extruder-laminator was built by Dilts Machine Works Div., The Black-Clawson Co., Inc., Dept. CP, Fulton, N. Y. . . . or for more information check CP 1347 opposite last page.)

Publish newsletter for extruders, converters, and coaters

Packaging developments and applications of plastics are summarized in illustrated newsletter for extruders, converters, and coaters. The monthly publication presents case histories of successful packaging applications.

Newsletter "Packaging with Plastics" may be obtained by writing to Bakelite Co., Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N. Y. When inquiring specify CP 1348 on handy form opposite last page.

These huge tank sections are protected against acid attack by U.S. Permobond.



Their shipment from maker to "U.S." plant to customer was handled by "U.S."

The expansion plans of a Southern chemical plant called for the design of a processing tank that was so huge it could not be shipped in one piece.

So the steel fabricator's engineers, working with "U.S." engineers, designed the tank in 2 parts. The tricky task of transporting these immense sections from the fabricator to the "U.S." plant (where U.S. Permobond protective linings were installed) and from there to the chemical plant was *arranged* by "U.S." traffic specialists. When the 2 sections arrived at the chemical plant, "U.S." field service men vulcanized the joints after the halves were welded together, making a complete rubber lining with no seams or joints. Thanks to the Permobond® lining, the tank is immune to acid attack.

For protection against corrosion of tanks, piping, valves—get in touch with U.S. Rubber technicians at the address below.

"U.S." Research perfects it . . ." U.S." Production builds it . . . U.S. Industry depends on it.

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

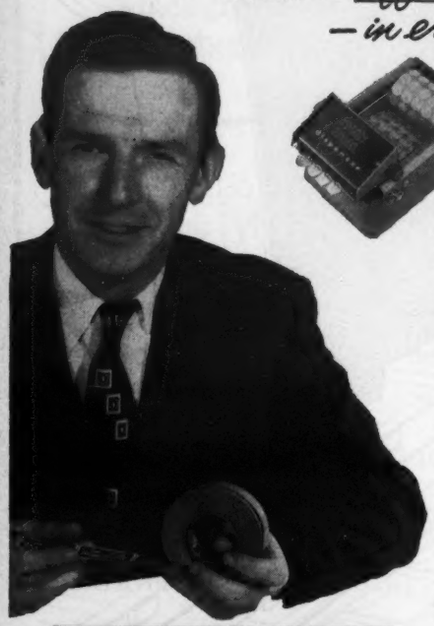
Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

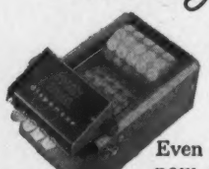
When inquiring check CP 1349 opposite last page

Avery pressure-sensitive Labels are easy and fast to use —and they're priced right!

Here's fast, clean, economical labeling. All waste motions are eliminated—for unlike ordinary labels, Avery *pressure-sensitive* Labels are applied dry. One simple motion—a fingertip pressure—and Avery pressure-sensitive Labels are on in an instant...without moistening! Clean, easy application even on hard-to-label surfaces...they won't dry out, pop or peel...and they stay neat and attractive even under temperature and humidity extremes.

"what a difference they make —in every department!"





PRODUCTION LABELING SIMPLIFIED WITH NEW AVERY "55" ELECTRIC DISPENSER

Even more labeling efficiency is now available with this new Avery "55" Electric Dispenser. Every time one label is used, another pops out—*automatically!* No matter how fast, this new dispenser easily keeps pace with labeling operations including speed ups and delays—without adjustment—actually pays for itself with time and money saved!

DID YOU KNOW?.....

that Avery originated pressure-sensitive labeling back in 1935? The benefit of years of experience in solving the requirements and problems of many industries, is at your service to help you develop a low-cost, economical labeling operation. There's no obligation...just explain your problems to your Avery representative — write or call the nearest Avery office listed in the yellow section of your telephone directory!

AVERY PRESSURE-SENSITIVE LABELS

Kum-Kleen. *KUM-KLEEN when you want a REMOVABLE label.*

Perma-grip *PERMA-GRIP when you want a PERMANENT label.*

☐ Send me free samples and information on Avery Pressure-Sensitive Labels.

☐ I'd like to know more about the new "55" dispenser.

☐ Please have the Avery man call.

AVERY ADHESIVE LABEL CORP., Custom Div. 123
1616 S. California Ave., Monrovia, Calif.
117 Liberty Street, New York 6
608 S. Dearborn Street, Chicago 5

name_____

address_____

city_____ state_____

our business is_____

When inquiring check CP 1350 opposite last page

Gives regulations on aerosols

Digest of Federal and municipal regulations covering sale and shipment of pressurized aerosol products has been prepared as a guide to manufacturers and marketers in complying with safe practice rules.

Publication deals primarily with regulations of Interstate Commerce Commission for labeling, product definitions, and shipping container specifications. Separate sections are devoted to regulations of other agencies as the Association of American Railroads, American Trucking Association, The Compressed Gas Association, Inc., Department of Agriculture, U. S. Post Office Department, U. S. Health Service, etc. Digest is punched for insertion in standard 5-ring, 6 x 9" binder and is 88 pages in length.

Digest of Regulations is available remitting $6 direct to Chemical Specialties Manufacturers' Association, Dept. CP, 50 E. 41st St., New York 17, New York.

Material looks like corrugated but molded flutes are solid — won't collapse . . .

cushioning increased, cost decreased

Uses: Molded corrugated board has found many uses as a packing material, dividers, or liners in the packaging and shipping of easily-damaged products.

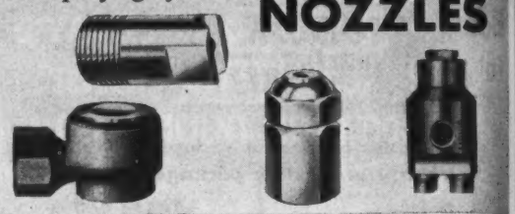
Features: Corrugated board looks liks conventional corrugated except that the molded flutes are solid. These flutes will recuperate from pressure and return to their original shape, a feature which doubles the board's cushioning effect.

Lower cost of this corrugated packing material is made possible by the waste boxes and wrappings and even newsprint, from which it is produced.

Description: Three separate

here's why we chose Spraying Systems

SPRAY NOZZLES



LOWER COST—it's surprising how often changeover to Spraying Systems nozzles reduces cost and materially improves the end product or process . . . due to unique design concepts and precision.

SELECTION—the range of choice in *standard* nozzles is amazing . . . over 10,000 in Catalog 24 alone . . . a type and capacity to fit exactly almost every need. It's rare that costly "specials" are needed.

PROMPT DELIVERY—huge stocks are maintained for fast delivery. For emergency needs, overnight delivery by air is a dependable part of Spraying Systems service.

Write for your free copy of Catalog 24 .

SPRAYING SYSTEMS CO.
3216 RANDOLPH STREET BELLWOOD, ILLINOIS
America's leading producers of Spray Nozzles

When inquiring check CP 1351 opposite last page

"COSTS CUT 60¢ per hour per machine"

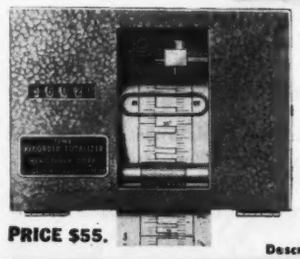
"...simplified our time study and cost analysis."

"...and, we will install your units on all our machines."

"...meets all our requirements. Ship 35 more units at once."

—just a few of the many comments we receive daily about...

TIME RECORDER-TOTALIZER



PRICE $55.

• This precision instrument provides accurate, permanent, chronological data about any machine, process or system in plant or office ...on a continuous chart-roll which lasts four months. Uses no ink. Totalizer shows accumulated "on" time.

Descriptive literature CP on request.

RECORDER DIVISION
HEAT-TIMER corporation
657 BROADWAY, NEW YORK 12, N.Y.

When inquiring check CP 1352 opposite last page

Paint on a Tough RUBBER COAT *for extra protection!*

Now—no more curing delay on new work! Tough new Tropical moisture- and acid-resistant RUBBER-BASE paints, for WALLS: seal "hot spots," stop moisture travel, let you prime, seal, finish-paint same day; for FLOORS: paint new-laid concrete, with dry, gloss finish in 4 hours; for MASONRY: protect from moisture penetration, no streaking, burning, self-cleaning; for MACHINERY: high-gloss enamel for extra protection where moisture, fumes, cleaners, acids attack metals.

***FREE!* Complete information sent at once—write today!**

HEAVY-DUTY MAINTENANCE PAINTS SINCE 1883

TROPICAL PAINT COMPANY
1128-1256 W. 70th
Cleveland, O.
Subsidiary Parker Rust Proof Co.

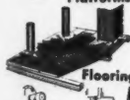
When inquiring check CP 1353 opposite last page

FOR MAXIMUM SAFETY all over your plant use Safety **GRIP-STRUT**

Pat. Pending

the new basic material, all in one piece (including channels), not welded, riveted or expanded in steel or aluminum, in standard sizes and gauges. Safety GRIP-STRUT presents an open space, in a diamond pattern, in excess of 55% of the area for ready access of light and air and gives a positive NON-SKID footing in all directions. Ideal for work platforms, stair and ladder steps, flooring, balconies, catwalks, machinery guards, fire escapes and for original equipment safety treads.

Work Platforms



Flooring

Important Safety Features

★ Fire proof
★ Slip proof
★ Maximum strength
★ Minimum weight
★ Easy to stand on
★ Cool in summer—warm in winter

Big Economy Features

Machine Guards

★ For balconies—no extra light needed below—no extra heat.
★ No extra supports necessary—channels are integral part of the material
★ No secondary sprinkler heads needed
★ Self-cleaning
★ Cut and installed like lumber by your own maintenance force
★ Low in original cost

Balconies

Distributors in all principal cities. Consult yellow pages in phone book under "GRATING."

SEND FOR NEW CATALOG

GRIP-STRUT division
THE GLOBE COMPANY • *Manufacturers since 1914*
4006 S. PRINCETON AVE. • CHICAGO 9, ILL.

When inquiring check CP 1354 opposite last page

products are designed around the basic continuous-molded corrugated sheet. First, the sheet itself can be used in applications calling for single face, indented paper, shredded paper, cellulose wadding, or excelsior inner wrap (Pillo-Pak). The second product is the molded corrugated sheet backed with virgin kraft paper and heavily scored for flexibility (Pillo-Flex). As an outer wrap it can be used in applications calling for flexible corrugated.

The third product is a molded corrugated specialty with a 9-pt all kraft liner laminated to its flutes (Pillo-Pad). It can be used in applicatons calling for single face, double face, excelsior pads or macerated paper pads.

(Pillo-Pak molded corrugated board is a product of Packaging Materials Corp., Dept. CP, 104 East 40th Street, New York, N. Y. . . . or for more information about manufacturer's product, reader may simply check CP 1355 on the convenient Reader Service slip which is located opposite last page.)

Offers data sheet on bagging scale

Product data sheet describes bagging scale. Equipped for either manual or automatic operation and will handle grain, crumbles, pellets, range cubes, granulated feed and other mill products in weighings of 100, 50, and 25 lb.

Operation of scale is discussed, as well as standard and optional discharge features. Capacity, discharge rate, accuracy and scale components are listed. Dimensioned engineering drawing is also included.

Data Sheet No. 5001 is available from Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N. J. When inquiring about this product, reader may simply specify CP 1356 on the convenient Reader Service slip which is located opposite last page.)

You can solve your tough corrosion problems by using Bitumastic® Coatings

Here is a porous surface being protected by Bitumastic® No. 50. This heavy-duty coating—applied over a primer—builds up a barrier that cannot be penetrated by moisture and corrosive elements in the soil.

TOUGH CORROSION PROBLEMS can be solved, but not by using ordinary paints or conventional protective coatings. For long-term protection, it takes *specialized* protective coatings . . . the Bitumastic Coatings Koppers makes.

Bitumastic Protective Coatings are specially formulated from a tar-pitch base* that is, for all practical purposes, impervious to moisture. These coatings keep moisture away from exposed metal surfaces . . . and that's the *best* way to stop corrosion.

With tough, durable Bitumastic Protective Coatings, a thickness up to eight times that of ordinary paints can be obtained in one application. Where other factors are equal, the *thicker* the coating the *longer* the period of protection.

Send for a set of free booklets describing the family of Bitumastic Protective Coatings. At the same time, tell us about *your* corrosion problems so that we can suggest a satisfactory solution. There is no obligation, of course.

**Hi-Heat Gray is a non-coal-tar vehicle and metallic pigment.*

KOPPERS COMPANY, INC.
Tar Products Division, Dept. 1079-T Pittsburgh 19, Pennsylvania
DISTRICT OFFICES: BOSTON, CHICAGO, LOS ANGELES, NEW YORK, PITTSBURGH, AND WOODWARD, ALA.

MADE ONLY BY KOPPERS
BITUMASTIC PROTECTIVE COATINGS
SOLD THROUGH INDUSTRIAL DISTRIBUTORS
KOPPERS ®

When inquiring check CP 1357 opposite last page

Clean, thorough particle-size separations on most dry powdered, granular, flake, or crystalline materials; big capacity in minimum floor space and head room; and dust-tight, sanitary operation *mean better sifting or grading with the BAR-NUN* Rotary Sifter.

Exclusive 4-point drive moves entire screen area in complete, single plane rotary motion—eliminates flexible supports for sifter box. All-metal box is quickly opened for easy cleaning or removal of sieves. Precision construction and balancing uses less power and contributes to long life and low maintenance costs. Users claim outstanding operating economies and advantages.

Available in several sizes, for single or multiple separations. A choice of sieves and sieve frames meets a wide variety of requirements. Location of outlets optional to meet plant material flow requirements.

Complete Information and Recommendations for Any Sifting Job on Request

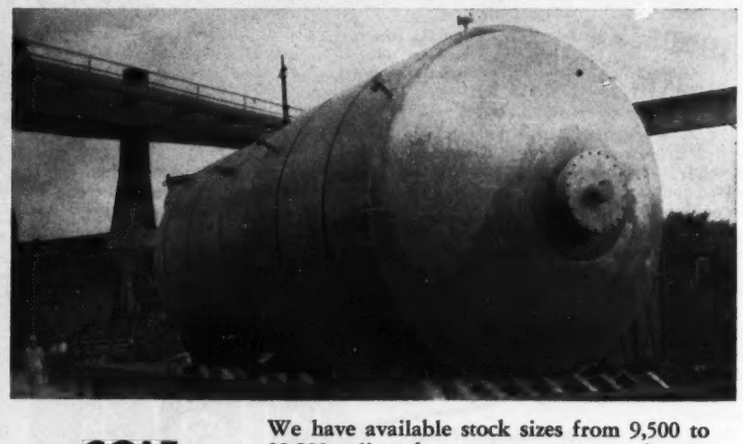
FEEDING · MIXING · SIFTING · GRINDING · WEIGHING · PACKING and PACKAGING EQUIPMENT FOR THE PROCESS INDUSTRIES

B. F. GUMP CO.

Engineers and Manufacturers since 1872

1344 S. Cicero Avenue, Chicago 50, Illinois

When inquiring check CP 1358 opposite last page



COLE ALUMINUM TANKS

We have available stock sizes from 9,500 to 22,800 gallons for pressure storage, and tanks of 99.6% pure aluminum for hydrogen peroxide from 5,000 to 11,150 gallons. COLE can furnish tanks made of steel, aluminum and stainless steel—built in accordance with ASME Code—to meet all insurance requirements.

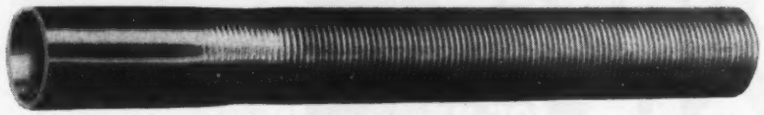
R. D. COLE Manufacturing Co., Newnan, Ga.

- TANKS
- TOWERS
- CYLINDERS
- VESSELS
- STANDPIPES

• *We invite your inquiries for high pressure storage tanks, elevated tanks, acid or oil storage tanks, bins, boilers, stacks, etc.*

When inquiring check CP 1359 opposite last page

In condensing straight-run gasoline from the overhead of a crude fractionating tower, refinery finds that finned tube —



Improvement in heat transfer is made possible by the greater surface area provided by the 1/16" high fins on the tube

increases heat transfer 70%

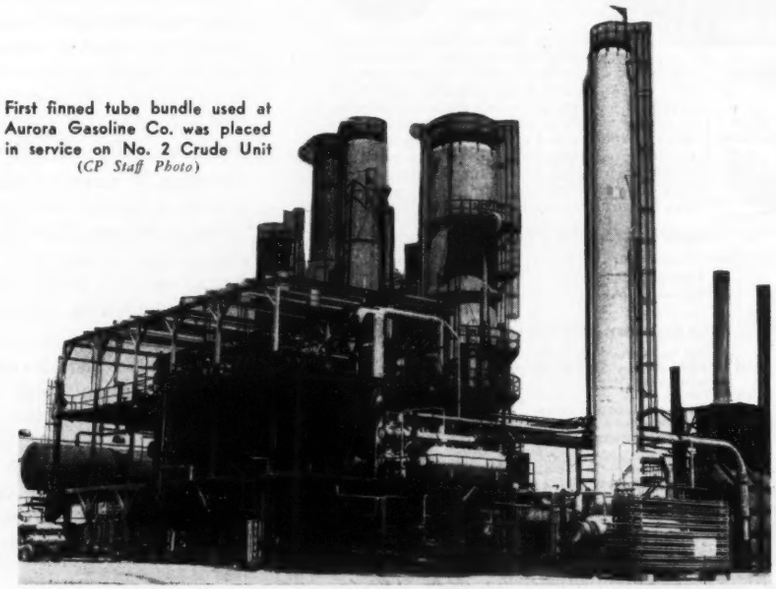
Good performance of first bundle prompted company to install nine additional units at other locations

By **GORDON WEYERMULLER**, Associate Editor
With **PETER BLASCO**, Asst. General Manager
Aurora Gasoline Company, Detroit, Mich.

Substitution of integral finned tube for plain tube in heat exchangers at Aurora Gasoline Company has increased the overall heat transfer coefficient by 70% (when referred to the inside surface area, or feet of tubing).

First bundle placed in service which contained the low-finned tube was installed in 1952 at company's Detroit refinery. It is used for condensing straight-run gasoline from the overhead of No. 2 Crude Unit.

More efficient heat transfer obtained with integral finned tube in this installation prompted company to install two similar bundles on a platformer-prefractionator at



First finned tube bundle used at Aurora Gasoline Co. was placed in service on No. 2 Crude Unit (*CP Staff Photo*)

OPERATIONAL TEST DATA
Aurora Gasoline Co.

	Plain Tube	Finned Tube
Tube characteristics	16 BWG Admiralty ¾" OD — 0.065" wall	16 BWG Admiralty ¾" OD — 1/16" fins
Total length of tube, ft	8,000	8,000
Total outside surface area, sq ft	1,522	3,280
Naphtha condensate, lb/hr	19,780	27,350
Heat transfer, Btu/hr	3.96×10^6	5.82×10^6
Corrected LMTD, °F	75.4	64.1
Overall coefficient U_o Btu/hr/°F/sq ft outside	34.4	27.7
Overall coefficient U_L Btu/hr/°F/ft length	6.75	11.32

their Muskegon, Michigan refinery. These bundles, placed in service in early 1955 condensing light gasoline and oil, are doing a good job. Recently seven finned tube bundles were installed on a new gas concentration unit and cat cracker at Detroit. This area has not gone into production as yet.

Improved heat transfer obtained with finned tube is shown by operational test data in accompanying table which was recently obtained on first installation at Aurora Gasoline Company. This condenser was originally a plain tube condenser with two bundles. One bundle was replaced with finned tube, permitting an excellent comparison to be made. As shown, overall heat transfer coefficient, based on a one foot length of tubing in both cases, was found to be 11.32 Btu/hr/°F/ft for the finned tube and 6.75 for the prime surface tube, an increase of about 70%.

Finned tube fabricated of 90-10 Cu-Ni was placed in this bundle in 1952. In 1954 bundle was retubed with Admiralty finned tube. Admiralty was used in all of the later installations since it was found to be preferable for this service with respect to corrosion resistance. When 90-10 Cu-Ni was being used, operational test data indicated an improvement in heat transfer of 80% over the plain tube.

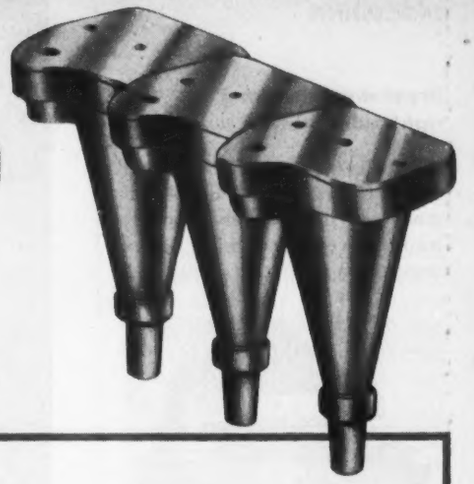
Aurora has found that practically no fouling occurs on the finned exterior of the tube, which is the product side. Experience has shown that, due to the increased heat flux through the finned tubes, the quality and the velocity of the water on the tube side have more effect on the heat transfer rate than would be the case with prime surface tubes. Tube bundles are acidized approximately every four months.

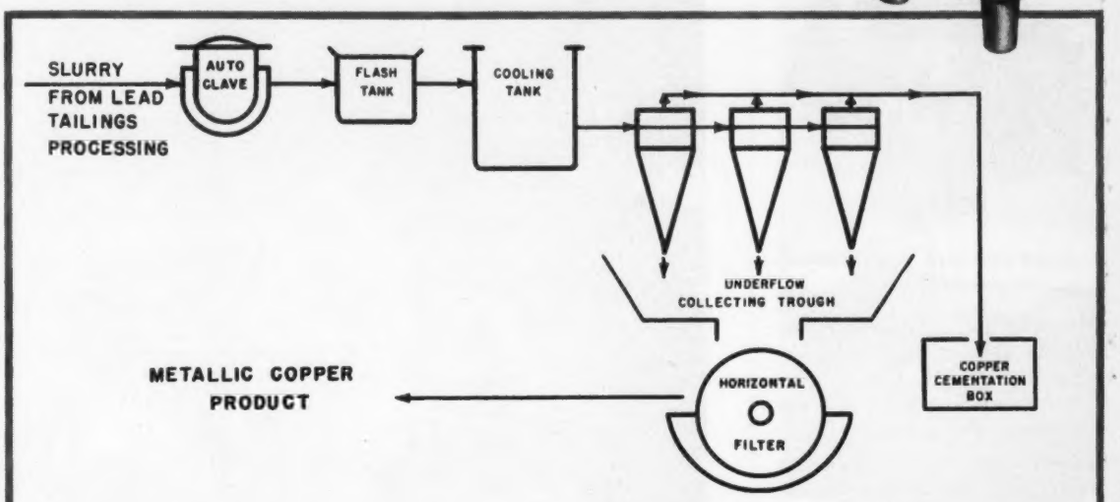
Helical fins on tube are extruded from thick-walled

(*Continued on page* 155)

These Heyl & Patterson 3" Cyclones

improve the Recovery of Copper from Lead Tailings





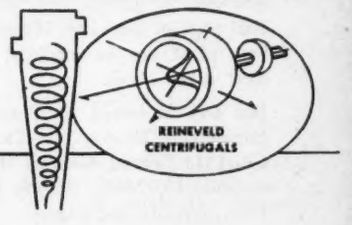
The engineers of a large Lead Company wanted to improve the system they had been using to remove metallic copper from tailings. They wrote to Heyl & Patterson, giving an outline of their problem.

A H&P Engineer visited the plant to see the original recovery system. After watching it in operation, he made a rough sketch of a New System utilizing H&P 3" Cyclones. Engineers in the H&P Special Apparatus Division approved the proposed system and suggested that a test be made under actual operating conditions. The results showed that H&P 3" Cyclones would recover 98-99% of the freshly precipitated Metallic Copper . . . a substantial gain over the original method . . . as well as rejecting an undesirable calcium salt.

HOW THE NEW SYSTEM WORKS:

The Tailings are first processed at a high temperature. After processing, the slurry is reduced to about 170° F., and is fed from a cooling tank to H & P 3" Cyclones. The cyclone underflow contains 98-99% finely divided metallic copper at 15-20% solids by weight. The overflow is carried to a cementation box where the soluble copper is removed. The metallic copper, a spongy, cake-like mass, discharges directly into a horizontal filter. When removed from the filter, the copper metal product has a moisture of 12-15%, and is ready for marketing.

Heyl & Patterson
INC.

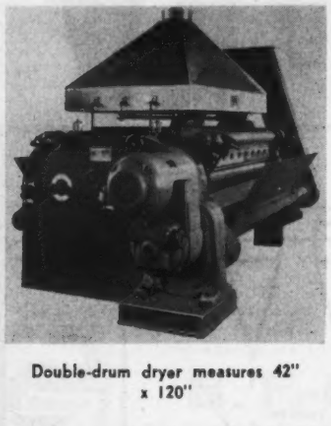


55 FORT PITT BLVD. • PITTSBURGH 22, PA.
PHONE COurt 1-0750

When inquiring check CP 1360 opposite last page

Dryer manufacturing rights sold

All patents and manufacturing rights for single and double atmospheric drum dryers formerly made by Yeast Processing Equipment Company have been sold.



Double-drum dryer measures 42" x 120"

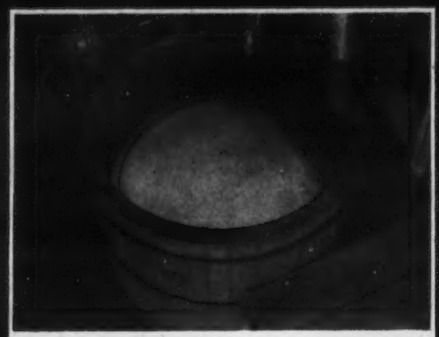
Purchaser plans to enlarge and improve line to meet wider applications. Added services being offered include pilot plant and laboratory testing facilities.

(Dryer rights were purchased by Davenport Machine and Foundry Company, Dept. CP, 3200 Lamp Street, Davenport, Iowa . . . or for more information check CP 1361 on handy form opposite last page.)

Bulletin describes "package-type" sand washing

Features, construction, performance, and operation of scrubbing, washing, and sizing plant are described in eight-page bulletin. Two-page cutaway shows flow of materials through the package-type plant, which can turn out up to five sizes and over-size of gravel and sand. Full page of drawings illustrate how plant can be modified to meet other needs.

Bul 648 is issued by Pioneer Engineering Works, Inc., Dept. CP, 1515 Central Avenue, Minneapolis 13, Minn. Specify CP 1362 opposite last page.



Closeup of Stainless Steel wire filter screen. It has been in continuous service for 2½ years.

"These

IN THIS Niagara Stainless Steel filter, mother liquor is separated from the solids of furoxone.

Stainless Steel filters just don't wear out"

says Norwich Pharmacal Company, Norwich, New York

The Norwich Pharmacal Company is one of the great pharmaceutical houses of this country. Lately, they have attained new distinction as the nation's only source of furacin. Processed furacin is used as a salve for skin graft surgery, and is also helpful for infections of the eye, ear, nose and throat. Raw furacin is used in animal food supplements.

In the production of semicarbazone, an intermediary, diacetate is pumped through a filter that formerly used canvas screens. The screens lasted only a week or two; and in that time they had to be removed and washed 10 to 15 times. It took about 20 minutes to change or clean a screen.

Stainless Steel filter screens were installed 2½ years ago, and, according to Norwich supervisors, "They look as though they will last indefinitely. The Stainless Steel screens have eliminated fear of contamination, too."

Stainless Steel is used in dozens of places in the whole complex process; in nitric acid pumps, nitrators, drums, centrifuges and in the big rotary dryer. According to the supervisory personnel, Stainless Steel keeps the product 100% pure, is very easy to clean, outlasts any other practical metal at least two to one, and the maintenance costs are very low.

These are some of the reasons why so many chemical processors specify USS Stainless Steel for new equipment.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

The three tanks shown here are Stainless Steel. Piping and pumps are also mostly Stainless.

USS

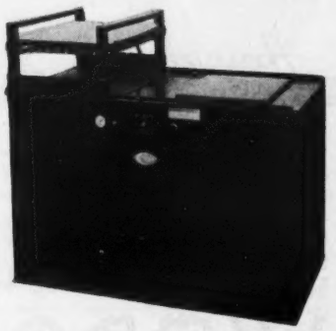
UNITED STATES STEEL

Low cost outstanding feature of vacuum forming press

Uses: Forming products, parts, displays, and packages from thermoplastic sheets.

Features: Compact machine stands 54" high, weighs 300 pounds, and requires only 28 x 59" floor space. Unit is reported to be first production-size vacuum forming press selling for less than one-thousand dollars.

Description: Machine can use molds of plastic, wood, metal, or plaster to shape many types of thermoplastic films and sheets. Molds of any size from 2 x 2" to 16 x 16" may be used. Draws up to depth of 5" can be obtained.



Compact vacuum forming press can use molds made of plastic, wood, metal, or plaster

Unit has surface-ground 18 x 18" platen, timers for vacuum valve, vacuum gage, 3.0 cfm vacuum pump, 15-gallon surge tank capacity, and automatic cycle control of the vacuum operation. Press has 22 x 22" heater with 3½ kw capacity.

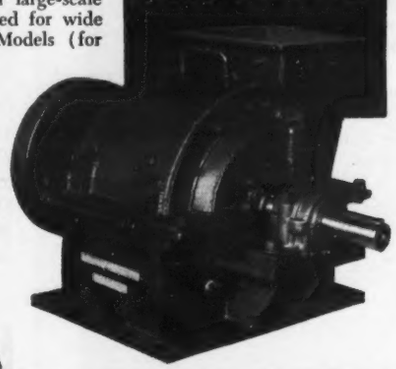
(Model 88 vacuum forming press is product of Vacuum Forming Corporation, Dept. CP, Port Washington, New York . . . or for more information check CP 1363 on handy form which is located opposite last page.)

For more information on product at left, specify CP 1364 . . . see information request blank opposite last page.

PRECISE REDUCTION for { EXPERIMENTAL LABS / PILOT PLANTS / TEST RUNS

American No. 13 Series CRUSHERS

Designed for capacities beyond those of lab mills and below those required for large-scale crushing operations. Effectively used for wide range of materials. Up-Running Models (for maximum fines); Down-Running (for minimum fines). Equipped with rings or any of a full variety of hammers. Backed by over 40 years' experience in building reduction equipment. Write for Catalog on "13" Series Crushers.



FREE Laboratory Service

Send material sample for test reduction and recommendations for reduction equipment. No obligation.

American PULVERIZER COMPANY — Designers and Manufacturers of Ring Crushers and Pulverizers

1241 MACKLIND AVE. • ST. LOUIS 10, MO.

When inquiring check CP 1365 opposite last page

EFFECTIVE, ALL-DIRECTIONAL VIBROLATION

MOVES GRANULAR OR WET MATERIAL NOISELESSLY

The simplest, most quiet answer for moving materials in hoppers, chutes and bins. One moving part, no lubrication, no maintenance, never harms the equipment on which it is mounted. Instantly self-starting every time. Vibrolator is the only vibrator that can guarantee this regardless of operating conditions. Write for catalog. You will also receive form for describing your problem. No obligation!

VIBROLATORS®

®Vibrolator is a registered trade name and applies only to the patented Peterson Vibrolator.

MARTIN ENGINEERING COMPANY

155 KEMP ST. NEPONSET, ILL.

When inquiring check CP 1366 opposite last page

Treated cotton filter cloth resists chemicals, mildew, shrinkage . . .

cost is close to that of untreated cotton filter cloth

Uses: On filter presses and rotary vacuum filters. Cloth also offers good possibilities in dust collection work where dust release is an important factor.

Features: Treated cloth is reported to offer many advantages found in synthetic fabrics at cost close to that of untreated cotton filter cloth.

Description: Designated as "M" treated cotton filter cloth, product is resistant to many common chemicals, and also resists mildew, shrinkage, and wrinkling. Cloth is available in chain weaves, hose and number ducks, filter twills, sateens, drills, and flannel. Product has been used successfully in applications where combination of easy cake release, good chemical resistance, and dimensional stability are important operating factors.

("M" treated cotton filter cloth is product of The National Filter Media Corporation, 1717 Dixwell Avenue, New Haven 14, Conn. . . . or for more information check CP 1367 on handy form opposite last page.)

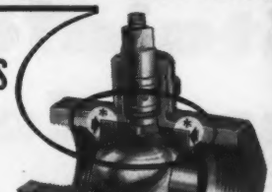
Classifier is designed for 10-20 microns

Physical characteristics, historical development, capacities, ranges of separation, and operating results of multiple cyclone classifier are discussed in six-page illustrated bulletin. Unit consists of molded rubber block cyclones, either 30 or 50 mm in diameter, installed in a common housing. Classifier is designed for separations in the 10 to 20 micron range.

Bul 2504 is issued by Dorr-Oliver Incorporated, Dept. CP, Barry Place, Stamford, Conn. When inquiring specify CP 1368 opposite last page.

NEW Double-Seal* BALL VALVES

316 STAINLESS WITH TEFLON FOR CHEMICALS



Also available in aluminum, naval bronze, carbon steel and 303 stainless, new JAMESBURY Double-Seal ball valves are designed specially for the chemical industries to handle the widest range of media. Teflon, Hypalon, Buna-N and Neoprene to meet any service requirements . . . . For high vacuum and pressures of 300, 600 or 1200 psi in either direction . . . . Sizes from ¼" to 2" . . . . Low torque quarter turn operation. Handle the most difficult media with JAMESBURY valves.

Write for full information. Engineering recommendations immediately available.

Please address your inquiries to

JAMESBURY CORP.
62 Millbrook St.
Worcester 5, Mass.

Manufacturers of Hydraulic Devices

When inquiring check CP 1369 opposite last page

Liquid Density CONTROLLED

continuously; accurately; automatically

In Chemical Processing. Controls density of organic and inorganic acids, alcohols, amines, chlorine compounds, esters, ethers, glycols, aliphatic hydrocarbons, aromatic hydrocarbons, ketones, and oxides; controls density of solutions of organic and inorganic compounds. Used during production . . . in blending, mixing, separation, recovery, dilution, and concentration.

In Food Processing. Controls density of sugar syrups, fruit juices, molasses, coffee liquors. Used during blending, mixing, dilution, and concentration.

In Industrial Processing. Controls density of process liquids in paper, plastic, leather, textile, and other industries; controls density of acid liquors, tanning liquors, spin bath acids, caustics, brines, resins, clay slurries, etc.

In Petroleum Processing. Controls liquid density of "in process" chemicals like oleum; controls density of hydrocarbon fuels, oils, alkylated acids, wax streams during refining; controls density of cutting oils, solvents, gasoline additives, other petro-chemical compounds during blending.

PRINCO densitrol

Measures, Records, Controls Liquid Density

Calibrations for specific gravity, API, Baumé, Brix, or Twaddell. Remote instrumentation; explosion-proofed models; automatic temperature compensation. For ranges, calibrations, and other specifics, ask for Bulletin W-4.

PRINCO

PRECISION THERMOMETER & INSTRUMENT CO.

1434 BRANDYWINE STREET, PHILADELPHIA 30, PA.

When inquiring check CP 1370 opposite last page

FINNED TUBE

(*Continued from page* 151)

tube to a height of 1/16", permitting 19 fins per inch. Extrusion process produces a smooth fin without any sharp angles or crevices. Ends of the tube are left without any fins and are designed so they can be easily substituted for plain tube in an existing installation.

Tube is called "integral finned tube" since the fins are a part of the tube itself. This eliminates any possibility of a "fin joint efficiency loss" or of the fins breaking loose from the tube wall. A ¾" finned tube has about 2½ times the outside surface area as that of a ¾" plain tube, which makes the improved heat transfer possible.

(Trufin Type S/T integral finned tube used at Aurora Gasoline Co. is a product of Wolverine Tube, Div. of Calumet & Hecla, Inc., Dept. CP, 1850 Guardian Bldg., Detroit 26, Mich. . . . or for more information check CP 1371 on handy form opposite last page.)

Scale-model conical dryer-blenders available for test purposes

Scale models of glassed-steel conical dryer-blenders are being offered for process evaluation work. Units give reliable indication of results which may be expected with production-sized equipment. One unit is permanently located at manufacturer's research laboratory and a second is available for shipment to client's plants. Tests are run without charge at the laboratory. Units can be used for every acid except hydrofluoric, and alkalis up to pH 12.

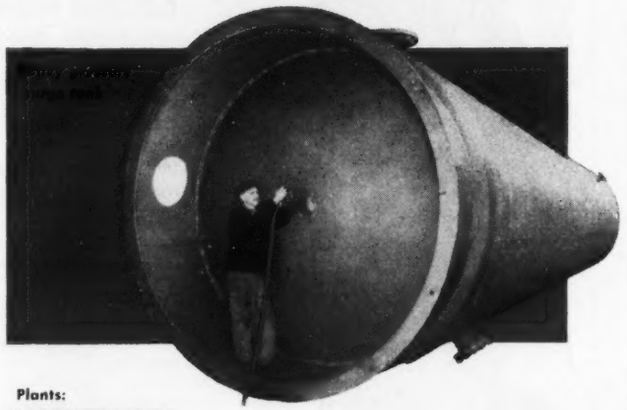
(Scale-model glassed-steel dryer-blender is available from Project Engineering Department, The Pfaudler Company, Dept. CP, 1000 West Avenue, Rochester 3, New York . . . or for more information check CP 1372 on handy form which is located opposite last page.)

Catalog lists over 600 users of self-cleaning strainers

Photos, descriptions, specifications, and other pertinent information about automatic and manually-operated self-cleaning strainers are included in 26-page catalog. Units are used to remove fine suspended particles from water, oil, alcohol, and other liquids. Brochure lists names of over 600 users.

Catalog on self-cleaning strainers is issued by S. P. Kinney Engineers, Inc., Dept. CP, 201 Second Avenue, P. O. Box 445, Carnegie, Pa. When inquiring specify CP 1373 on handy form opposite last page.

Koven
WAS MAKING INDIVIDUALIZED CHEMICAL EQUIPMENT



Today's population of 165 million is proof of a potential realized — and the accomplishments of these millions continue daily to reaffirm our strength. KOVEN, one of America's leading steel fabricators, has been a part of the industrial growth and achievement which has accompanied our population increase. The results of almost 75 years of experience, research and skill are what KOVEN brings you. For fast, efficient, economical output; for individualized equipment—built to your exact needs—call or write for a consultation with a KOVEN representative—of course, no obligation. Send for Bulletin #550.

Specialists in intri[illegible]sing:
stainless steel
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all clad materials
Fabrication to all A.S.M.E. Codes

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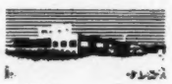

Trenton, N. J.

X-RAY INSPECTION FOR QUALITY CONTROL. KOVEN equipment in all metals and alloys includes: High pressure vessels, extractors, mixers, stills, kettles, tanks, stacks, breechings. Shop and field erected storage tanks 2 million gallons. High vacuum testing.

L. O. KOVEN & BRO., INC.
154-E Ogden Ave., Jersey City 7, N. J.

KOVEN FOR INDIVIDUALIZED EQUIPMENT SINCE 1881.

When inquiring check CP 1374 opposite last page

Water demineralized continuously, automatically, with DC current and plastic membranes

Process removes salts from water instead of water from salts

Uses: Removing ionized salts and minerals from water.

Features: Demineralization is accomplished by use of DC current in conjunction with selectively conductive, plastic membranes.

Process differs basically from other demineralization processes in that it removes the salts from the water rather than the water from the salts. Units operate continuously, automatically, and require virtually no operating attention. Total cost of fresh water produced is reported to be lower than that obtained by distillation, truck or ship transportation, or long, small-bore pipelines.

Description: Packaged units are available ranging in capacity from 1000 to 100,000 gallons per day. Membrane assemblies, called "stacks", are made in standard sizes and are readily replaceable. Membranes have high conductivity for electrical energy, show good resistance to hydraulic flow, and are mechanically and chemically stable to pressures encountered in the unit.

Unit consisting of five "stacks" operated in series is used to obtain a 20 gpm product flow rate and 92% demineralization from feed water. Rectifier for furnishing DC current is shown at extreme right

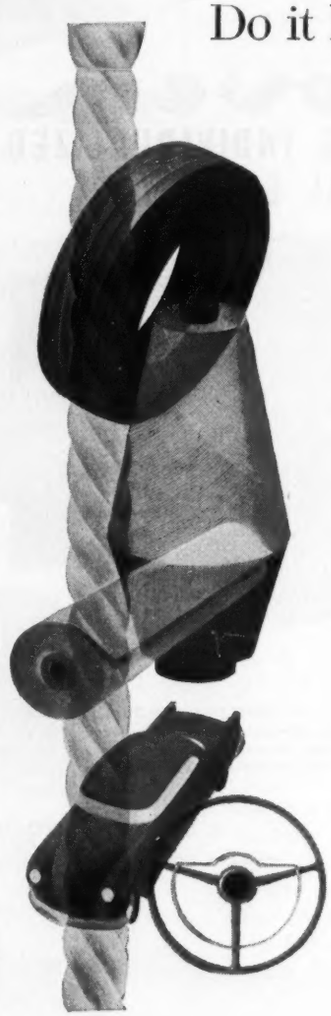
Stacks consist essentially of an alternating array of cation and anion membranes placed between a cathode and an anode electrode to form a multi-

Handling

cellulose acetate · acrylics · acrylonitrile
polyamides (nylon) · rayon
synthetic resins · formaldehyde ?

Do it better, cheaper...with

ALCOA ALUMINUM



CELLULOSE ACETATE has no action on aluminum. ALCOA Aluminum tankage, piping, trays, rotary driers, fume ducts, hoods and conveyors are used in the production of cellulose acetate. ALCOA Aluminum is also being used successfully in acetylators, precipitators, washing equipment, dephlegmators, stills, condensers and evaporators.

CELLULOSE ACETATE BUTYRATE is handled in aluminum silos, piping and conveyors. ALCOA Aluminum does not discolor the product and is nonsparking.

ACRYLICS are successfully handled in storage tanks, heat exchangers, distillation towers, reactors, piping and textile machine parts made of ALCOA Aluminum.

SYNTHETIC FIBERS, as well as their ingredients, are handled in ALCOA Aluminum process equipment and tankage. In the production of *nylon*, for example, aluminum storage tanks, tank cars, piping and textile machine parts are used. The *rayon* industry makes extensive use of ALCOA Aluminum, including aluminum hoods, ducts, desulfurizing equipment, piping, tubing, extractors, pallets, conveyors, precipitators, traverse bars, guide holders, gear covers, separator blades, reel frames, emulsion rolls, spinning compartment covers, spools and buckets.

ACRYLONITRILE has no action on aluminum even in the presence of moisture. ALCOA Aluminum distillation, piping and storage facilities are used to prevent the discoloration of the product.

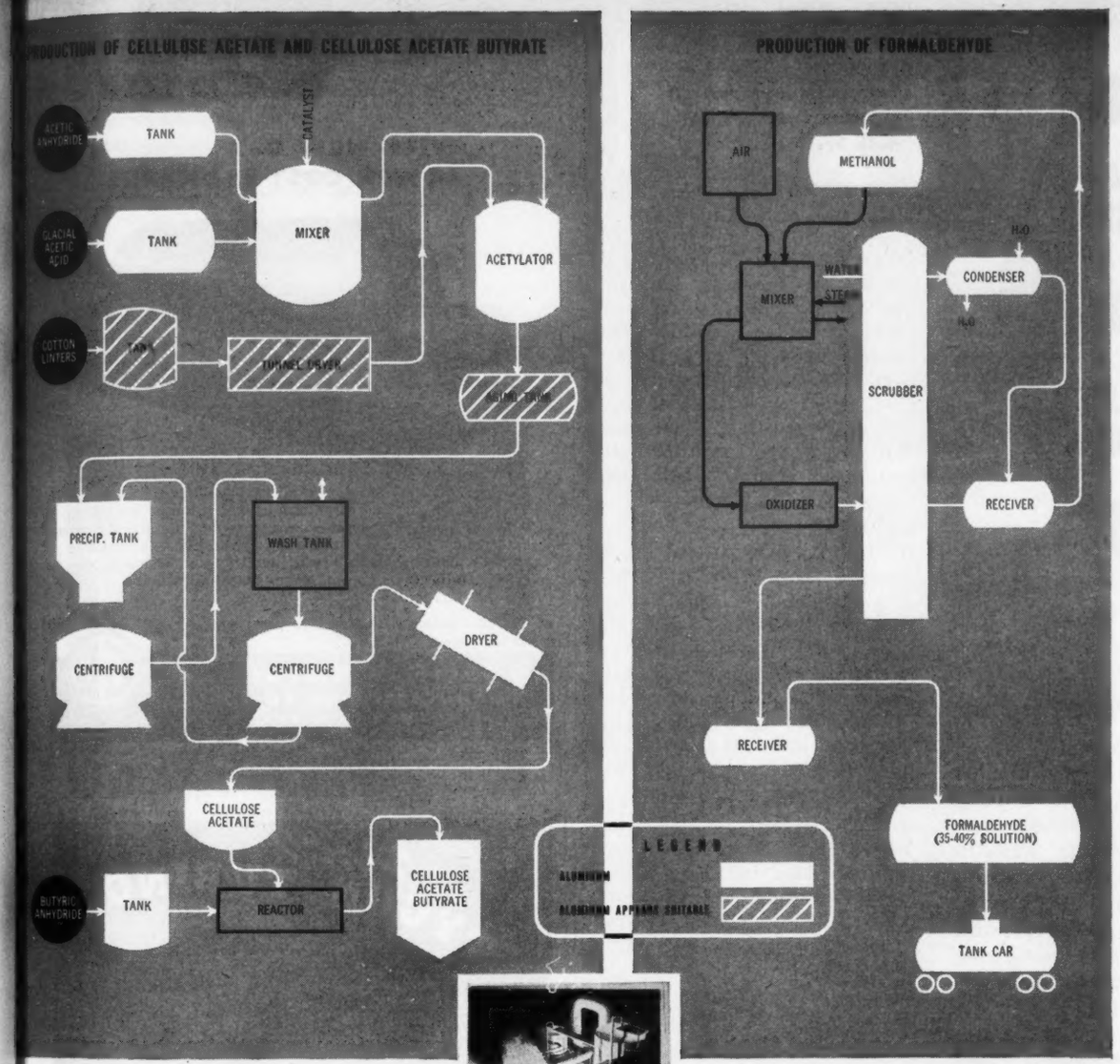
SYNTHETIC RESINS for the production of *plastics* are handled in ALCOA Aluminum storage tanks, stills, condensers, receivers, piping, heating coils, weighing tanks and reaction vessels.

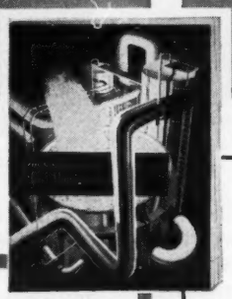
FORMALDEHYDE, when pure, has no action on aluminum. ALCOA Aluminum distillation towers, scrubbers, storage tanks, piping, heat exchangers, shipping drums and tank cars are in service. Commercial formalin solutions may cause an initial self-stopping attack.

compartment ion transfer cell. Upon application of DC voltage, a direct current is carried by the ions and flows through the solution and membranes. The positively-charged sodium ions (in the case of sodium chloride) tend to move toward the cathode and in passage, pass through a cation membrane. Similarly, the chloride ions move toward the anode, passing through an anion membrane.

Net result is removal of salt from the solution. Several pairs of cation and anion membranes are manifolded and connected in such a way that product can be fed and collected separately from the various compartments. Basic multi-membrane stack, when connected to proper piping and valves, pumps, electrical energy and control instruments, forms a packaged unit. Investment costs per gallon per day of capacity vary from $0.50 for 40% removal of salts and minerals, to $2.00 or more for 87% removal of salts. Operating costs can be figured on the use of about 7 kw hours per 1000 US gallons for each 1000 ppm removed.

(Water demineralizing equipment is product of Ionics Incorporated, Dept. CP, 152 Sixth Street, Cambridge 42, Mass. . . . or for more information about manufacturer's product reader may simply check CP 1376 on handy form which is located opposite last page.)





FREE. New ALCOA book, *Process Industries Applications of Alcoa Aluminum.* 80 pages of performance and design data. Write today. Use the coupon.

ALCOA ALUMINUM
ALUMINUM COMPANY OF AMERICA

Aluminum Company of America
902-K Alcoa Building, Mellon Square
Pittsburgh 19, Pennsylvania

Please send me your FREE, 80-page book, *Process Industries Applications of Alcoa Aluminum.*

Name_____

Company_____

Address_____

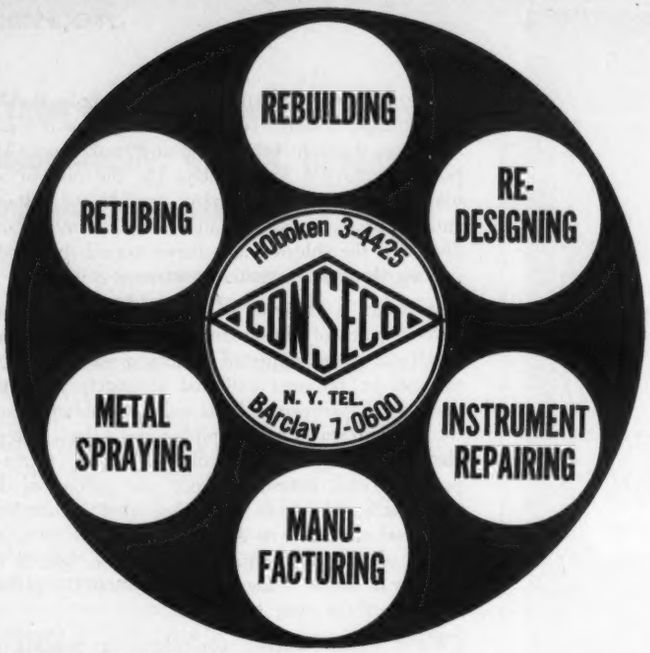
City_____ Zone____ State_____

Pelletizes taconite

This 9' diameter by 30' long 37-ton balling drum is one of 18 to be used to convert finely ground taconite concentrates to ½" diameter balls. Unit will have capacity of 30 to 45 tons concentrate per hour. Shell is lined with expanded metal and one inch of concrete. Reciprocating cutting bar inside maintains additional lining of adhering concentrate, which provides proper surface for ball formation. Cut spiral distributor on discharge end (right) will spread balls over vibrating screen to be located at 90° angle to discharge end.

(Balling drums are being built by Allis-Chalmers Manufacturing Company, Department CP, 1126 South 70th Street, Milwaukee 1, Wisconsin . . . or for more information about manufacturer's product, reader may simply check CP 1377 on the convenient Reader Service slip which is located opposite last page.)

When inquiring check CP 1375 opposite last page



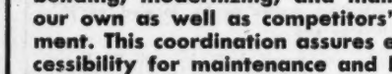
CONSECO SERVICE . . .

. . . as near as your telephone

When your heat exchanger or condenser or other tubular equipment suddenly quits . . . IT'S AN EMERGENCY . . . you spin your phone dial . . . *and in minutes, day or night, Sundays or holidays, a CONSECO REPAIR CREW is speeding to your plant.* Expert, fast, doing in hours what otherwise would take days . . . they're equipped with special tools and all the tubes, tube sheets or specialties you need, drawn from our complete stock. Yes, CONSECO SERVICE is as near as your telephone. Call our Maintenance Department.

CONDENSER SERVICE & ENGINEERING CO., INC. CONSECO

Designers and Builders of Equipment for Power, Refining, Chemical and Marine Industries



161 Observer Highway
HOBOKEN, N. J.

Equipment Designed and Built by CONSECO

Conseco and its subsidiaries design, build, and install power and processing equipment and accessories, some of which are listed here. Purchasers of Conseco equipment benefit from our maintenance division's quarter century experience in rebuilding, modernizing, and maintaining our own as well as competitors' equipment. This coordination assures easy accessibility for maintenance and low operating cost. Send for bulletins covering equipment in which you are interested.

HEAT EXCHANGERS
CONDENSERS
EVAPORATORS
STEAM JET AIR EJECTORS
STEAM GENERATORS
PRESSURE VESSELS
CENTRIFUGES
FILTERS and STRAINERS
PUMPS, INSTRUMENTS, SPECIALTIES

When inquiring check CP 1378 opposite last page

Automatic leaf shut-off protects against filter cloth breaks . . .

simple circular screen eliminates costly shutdowns

As a protective measure against filter cloth breakage, automatic individual leaf shut-offs are available on certain horizontal-leaf filters. Consisting of a circular 24x110-mesh screen mounted in the drain nipple of each leaf (through which all filtrate must pass before entering filtrate header) screens eliminate costly shutdowns and re-filtering due to cloth breakage.

In event of a break the screen becomes coated by solids and stops the flow of filtrate from that leaf. Amount of solids that pass initially is negligible. Even after backwashing, screen will still serve its purpose. Screen becomes coated again during next precoating operation and will continue to give protection until filter is opened for inspection.

(Automatic leaf shut-offs for Model H filters are product of Process Filters, Inc., a subsidiary of Bowser, Inc., Dept. CP, 1807 Elmwood Avenue, Buffalo 7, New York . . . or check CP 1379 opposite last page.)

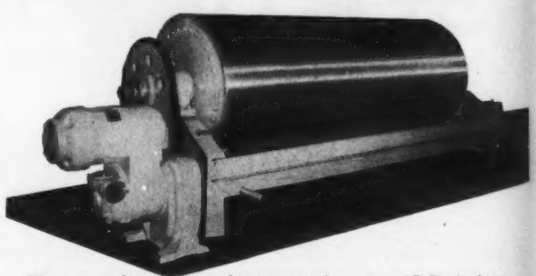
German mixer produces no rotary motion

German mixer, which produces no rotary motion, is described in four-page bulletin. Unit operates on same principle as centrifugal pump and produces violent overall turbulence. Viscosity range is over 3000 cp. Complete with photos, drawings, and charts, bulletin cites case histories, recommended uses, and specifications of mixers.

Bul RKM-10 is issued by Neumann and Weaver, Inc., Dept. CP, 22-12 Raphael Street, Fair Lawn, New Jersey. When inquiring specify CP 1380 opposite last page.

GET DOWN LOW

WITH NEW G-B LOWER COST FLAKERS!



We can point to many instances where new G-B designs have resulted in lower overall product flaking costs, too. This double-barrelled economy in flaker equipment design deserves *your careful re-examination* of your flaking costs as a means of product conversion. Phthalic anhydride, sulphur, benzene hexachloride, caustic, and resins of all types can be efficiently and economically processed by G-B flakers.

Our pilot testing facilities are at your disposal . . . no obligation.

GOSLIN-BIRMINGHAM MANUFACTURING CO., INC.
BIRMINGHAM • ALABAMA

When inquiring check CP 1381 opposite last page

FLEXIBLE AS STRING . . . GLASS-CLEAR . . . FEATHER-LIGHT . . . FULLY RESISTANT TO ACIDS, ALKALIES, OILS, GREASES, AND WATERS . . . MIRROR-SMOOTH . . . TOUGH AS LEATHER . . . NON-OXIDIZING . . . NON-TOXIC . . . LONG-WEARING . . . FOR THE TRANSMISSION OF LIQUIDS, GASES, AND SEMI-SOLIDS.

TYGON Tubing is available in six standard compounds — continuous lengths — bores up to 2" ID — with or without outer braid reinforcement. Special compounds and sizes made to order.

Write, today, for detailed information and technical Bulletin T-77!

2020

U. S. STONEWARE
AKRON 9, OHIO
PLASTICS AND SYNTHETICS DIVISION

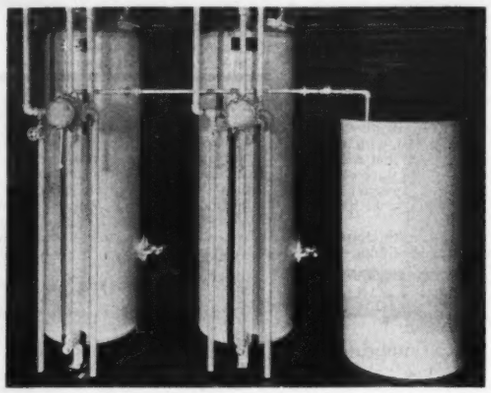
When inquiring check CP 1382 opposite last page

Softeners are designed to satisfy demands for small volumes of soft water . . .

units are easy to install and operate, require minimum amount of pipe

Uses: Supplying small volumes of soft water for chemical, textile, and other installations.

Features: Softeners are easy to install and operate. Units require minimum amount of pipe and can be supplied with either automatic or semi-automatic controls.



Zeolite water softeners are made in 13 sizes with flow rates ranging from 6.5 to 40 gpm

Description: Softeners are normally provided with a high-capacity polystyrene base resin. Resin is stable at all pH levels and can withstand temperatures up to 240°F. Units are made in 13 sizes with flow rates from 6.5 to 40 gpm. Need for large battery of valves and inter-connecting pipe is eliminated since single-control multiport valve carries out functions of back-wash, brining, rinsing, and service.

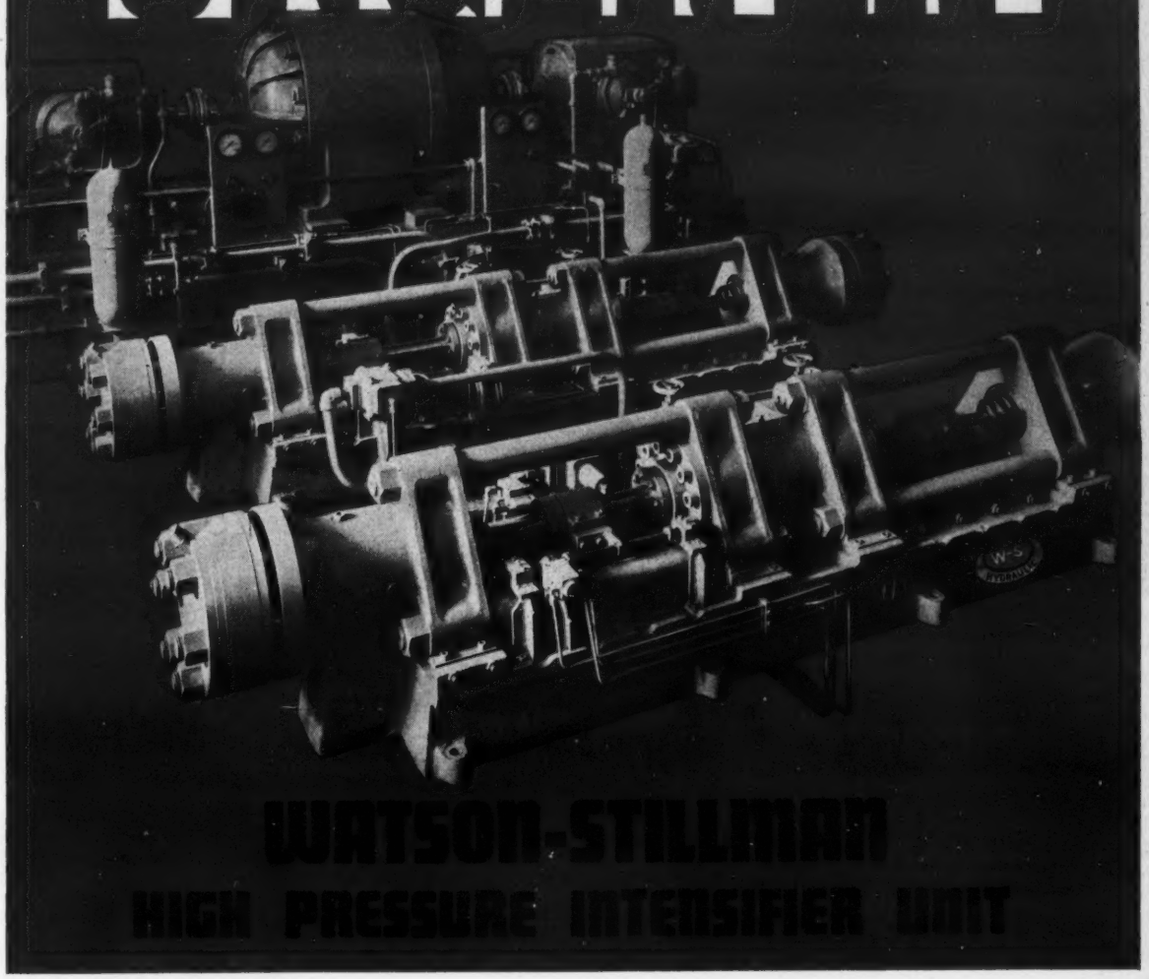
With automatic operation, all steps are carried out without operator's attention. Initiation of regeneration cycle is controlled by pushbutton, when equipped with semi-automatic operation.

(Type 210 Zeolite water softeners are product of Industrial Filter and Pump Mfg. Co., Dept. CP, 5900 Ogden Avenue, Chicago 50, Illinois . . . or for more information concerning manufacturer's product, reader may simply check CP 1383 on the convenient Reader Service slip located opposite last page.)

For a guide to processing ideas . . .

You'll find what you need in the handy Product Directory on pages 255 to 259. All products and processes are listed there.

LONGER LIFE



For longer life, a high capacity, *low speed* Watson-Stillman intensifier unit offers you a sound approach to the solution of the problems of packing and fatigue at pressures up to 100,000 p.s.i. Because of its slower piston speed, and resultant low rubbing velocity, packings last longer. Slower cycling speed reduces the number of stress reversals, increases fatigue life in high pressure cylinder and valve block. At this low speed of operation, you can expect 10 to 12 times the life of comparable high speed equipment.

High pressure intensifier units are only one of the Watson-Stillman "Completeline" of hydraulic machines and equipment. It will pay you to get in touch with W-S first, when it comes to vertical and horizontal pumps and accumulators, too. All W-S equipment is economical—both in first cost and operating cost.

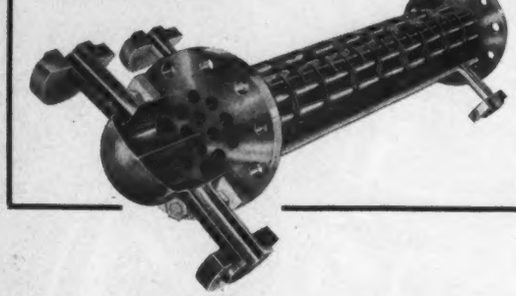
HKP THE WATSON-STILLMAN COMPANY DIVISION OF H. K. PORTER COMPANY, INC. 100 Altman Rd., Roselle, New Jersey

W-S HYDRAULIC

When inquiring check CP 1384 opposite last page

Heat Exchangers . . .
new low prices

Use of standard stockable components slashes cost of fixed tube sheet designs and other models.



Never before have these standard corrosion-resistant units been offered at such low current prices. Here's what you get—

Specifications—Standard Heat Exchangers (all sizes to 30″ nominal shell diameter)

Design Pressure: 75 psi shell side; 75 psi tube side.

Design Temperature: 350°F

Gaskets: Pfaudler Type CBS (Compressed asbestos with special Buna S binder. Suitable for acids and solvents except powerful oxidizers such as HNO_3, hot concentrated H_2SO_4, chlorosulfonic acid, chromic acid, brominations, and H_2O_2.)

Shell and Baffles: Carbon steel or Stainless, type 304 or 316 S.S.

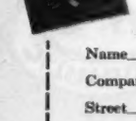
Tubes: Stainless steel, Type 316 or Type 304, ¾″ O.D., 18 gauge, welded.

Tube Sheets: Stainless steel, Type 316 or Type 304.

Bonnets: Stainless steel, Type 316 or Type 304 or Carbon Steel.

Code: Built to ASME Code U-69, and TEMA Class A Specifications.

Write or call your Pfaudler representative for fast delivery, complete specifications and prices on these heat exchangers—plus help in custom engineering a unit to meet any exceptional problems you may have. Or send coupon for Manual No. 837.



THE PFAUDLER CO.
Dept. CP-G-10, Rochester 3, N. Y.

Send Manual 837, giving application data and specifications on stainless heat exchangers.

Name_____

Company_____

Street_____

City_____ Zone____ State____

When inquiring check CP 1385 opposite last page

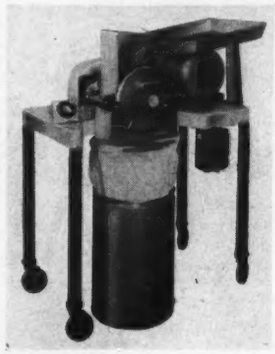
Pulverizer can be disassembled and reassembled in less than 2 minutes . . .

easy-to-clean unit especially designed for uses where purity of product is important

Uses: Grinding materials in 4 to 20 mesh range. Unit is especially designed for applications where products must be carefully guarded against contamination.

Features: Machine can be disassembled and reassembled in less than two minutes, making cleaning easy, and resulting in minimum down-time.

Description: Every part in contact with material being processed is made of 18-8 stainless steel. This includes feed tables, mill body, rotor shaft, hammer assembly, cover plates, and parts inside mill. Unit is powered by either a 3 or 5 hp motor, depending on capacity desired. Capacities of 500 to 2000 pounds per hour are obtained on average materials.



Every part of machine coming in contact with material being processed is made of 18-8 stainless steel

Through use of variable-speed drive, speed of hammers can be altered for quick changing of particle size. Volume of air passing through mill does not require other than simple outlet bag for air relief and dustless collection. Machine weighs about 200 pounds and requires floor space of 2 x 3′6″. Unit comes complete.

(Multi-grind pulverizers are product of Pulverizing Machinery Division, Metals Disintegrating Company, Inc., Dept. CP, 133 Chatham Road, Summit, New Jersey . . . or for more information check CP 1386 on handy form opposite last page.)

Bulletin lists operational data for gyratory screens

Gyratory screens for sizing, dewatering, dedusting, cleaning, and washing operations are reviewed in eight-page catalog. Details of construction and operation are given. Dimensions of the screen and three types of collection hopper bases are shown. Operational data from actual installations are also included.

Bul 243 is issued by Nordberg Manufacturing Company, Dept. CP, Chase and Oklahoma Avenues, Milw., Wis. Specify CP 1387 opp. last page.

accurately controlled CHEMICAL DEHYDRATION

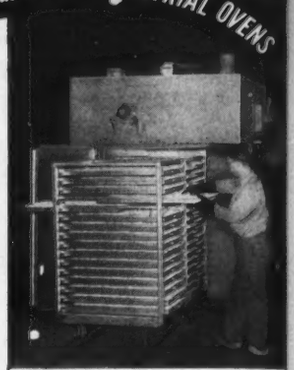
with Despatch V-39 and V-41 INDUSTRIAL OVENS

Here are two new ovens, proven in the field, that were developed especially for chemical dehydration and other processes that require larger air volume than normally found in standard ovens. Built-in exhaust fans can be regulated to control flow of air and will operate automatically at pre-set times.

THE DESPATCH V-39, a truck-loading, batch type oven, has proven itself in the chemical drying field. At Diamond Alkali Company's Painesville, Ohio plant they're reducing the moisture content of chromium chemicals from 15% to no more than 4% and holding it there. A 2-hour bake at 500°F does the job thoroughly!

Investigate the Despatch V-39 or V-41—you'll discover that they offer the large volume horizontal airflow that maintains exceptional temperature uniformity. They're double walled, with insulated construction that means top economy and have Micromatic control systems to hold temperatures within close limits.

Floor length doors make possible to roll loads directly into the V-39's 60 cu. ft. chamber or the big V-41's 101 cu. ft. oven. Both have 500°F ratings with gas, electric or steam heaters (heavy duty models rated at 650°F). Automatic safety switches and circuits protect the operator and the product at all times.



Trayloaded truck of chromium chemicals is readied for drying at Diamond Alkali Co. Trucks guide heavily loaded trucks into the V-39 oven—protect oven's interior.

For complete technical details write for Bulletin 100—it describes the complete line of laboratory and production ovens made by Despatch.

DESPATCH Established OVEN CO in 1902

DESPATCH OVEN COMPANY
343 Despatch Bldg., Minneapolis 14, Minn.

When inquiring check CP 1388 opposite last page

Jars, pots, tanks, etc. made from "U.S." Chemical Porcelain are leak-proof, mechanically strong, dense and of virtual *zero* porosity. They are completely inert to all chemicals except hydrofluoric acid and hot caustics. And porcelain contains *no iron* to be absorbed — no induced contamination! Its non-aging characteristics make for long, maintenance-free service life. No-seam construction, rounded corners and smooth lustrous white glazed surfaces provide for quick, easy cleaning.

Our complete Chemical Porcelain line of jars, pots and tanks includes a wide variety of stock items in capacities ranging from 2½ to 200 gals.

WRITE TODAY — *ask for* BULLETIN 410

U.S. STONEWARE *Process Equipment Div.*
Akron 9, Ohio 361-3

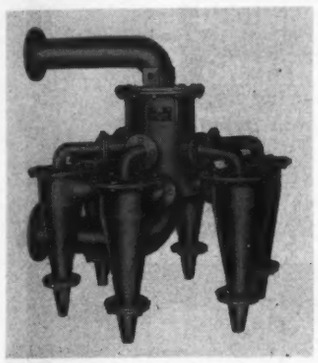
When inquiring check CP 1389 opposite last page

Up efficiency, save space with clustered cyclones

Uses: Thickening, dewatering, classifying, separating, densifying, clarifying, desludging, and desliming liquid-solid mixtures.

Features: Cyclones can be used individually or can be clustered around central manifold to obtain maximum efficiency in minimum of space.

Description: Units are available in wide range of stock sizes and capacities to handle any desired gallonage, and to achieve classified



Six 8" cyclones mounted on same manifold

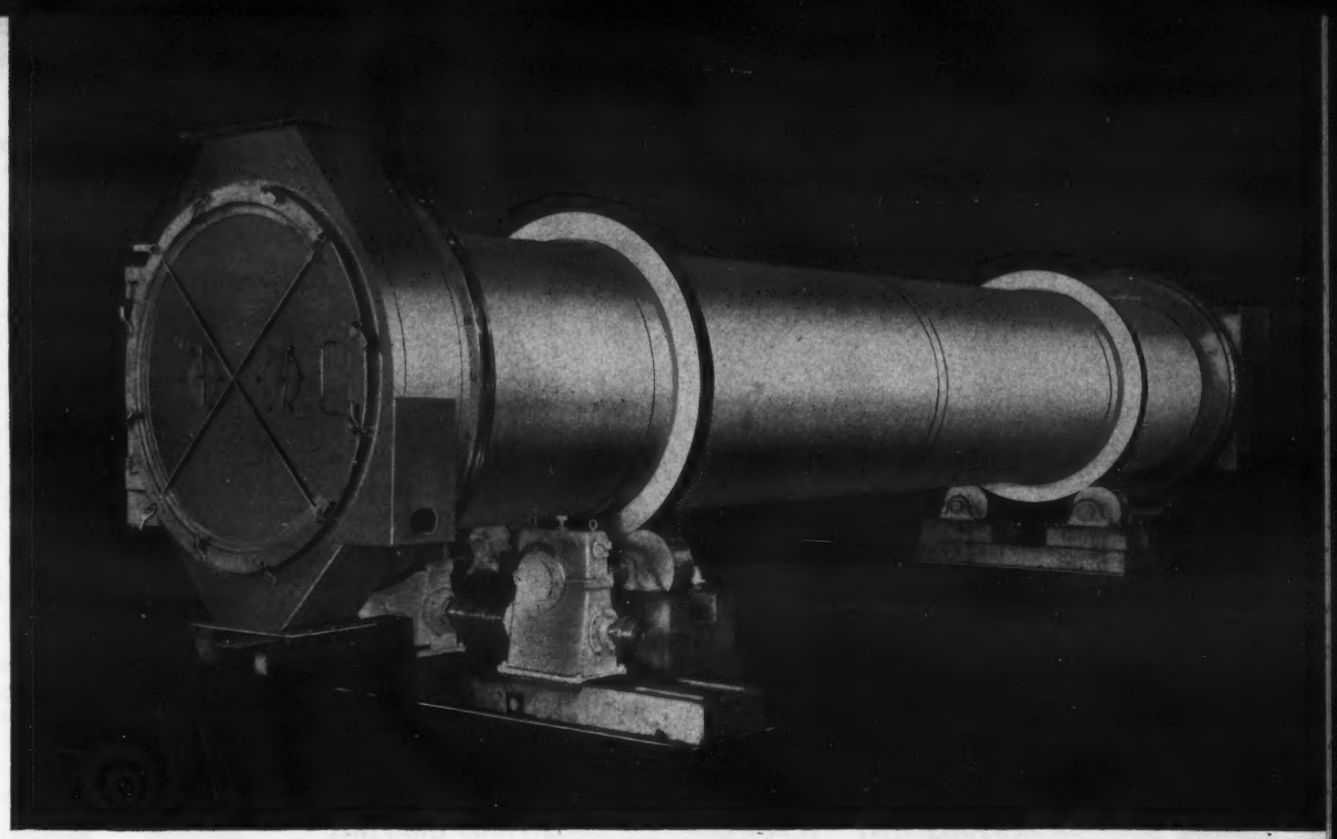
separation of any required size of solids. Cyclones are free of moving parts. Existing parts are readily replaceable and interchangeable with those of identical size units.

Large cyclone (20") has liquid-solid flow rate of 375 to 1200 gpm. Smaller 4" cyclone can handle 17 to 75 gpm.

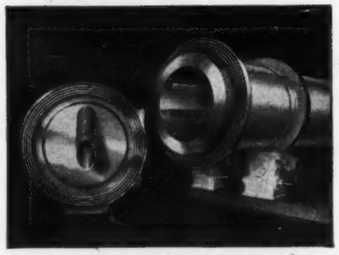
Up to six 8" cyclones can be mounted on same manifold to meet individual requirements.

(Clust-R-Clone liquid cyclones are product of Centrifugal and Mechanical Industries, Inc., Dept. CP, 146 President Street, St. Louis 18, Mo. . . . or for more information check CP 1390 on handy form which is located opposite last page.)

For more information on product at right, specify CP 1391 . . . see information request blank opposite last page.



stainless steel *Plastics Dryer*



Labyrinth Seal on 60" x 32' 0" Stainless Steel Plastics Dryer showing the Mirror-like Finish on the Shell and Flights.

Special Steam Jacketed Batch Dryer showing Dustless Discharge to Screw Conveyor and Condenser where Fines are Reclaimed from Vapors.

60" x 32'0" stainless steel dryer with all interior surfaces polished to mirror finish prevents color contamination—and spoilage—between different batches of a well known plastic.

● This is probably one of the most costly direct heat rotary dryers ever built. Even the feed and discharge breechings and inspection doors are of stainless steel. Inlet air used for drying is filtered. Discharge air is passed through a stainless steel cyclone dust collector. Fabricated in our shops, this unit typifies Bartlett-Snow's ability to design and build equipment for even the most exacting operating and service requirements.

DESIGNERS ENGINEERS **BARTLETT-SNOW** CLEVELAND 5, OHIO FABRICATORS ERECTORS

Dryers • Coolers • Calciners • Kilns

"Builders of Equipment for People You Know"

9 REASONS WHY "KARBATE" BRAND IMPERVIOUS GRAPHITE PROCESS EQUIPMENT DOES THE BEST JOB IN CORROSIVE PROCESSES

- Corrosion resistance
- Immunity to thermal shock
- No metallic contamination
- High thermal conductivity
- Low first cost and low maintenance
- Workability — readily fabricated and serviced in the field
- Sturdy, durable constructions
- Standard stock units
- Complete technical service

Manufactured only by NATIONAL CARBON COMPANY

■ Only the unique combination of properties provided by "Karbate" brand impervious graphite can virtually *eliminate* corrosion, contamination and thermal shock from your processes. You'll be pleased with the hidden economies you realize after replacing hitherto "satisfactory" process units with "Karbate" equipment.

Let us bring you up to date on the latest designs in this outstanding material. And remember — your operating-cost sheets don't have to be *bad* to be *bettered!*

WRITE FOR LITERATURE!

The term "Karbate" is a registered trade-mark of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY

A Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y.

Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco

IN CANADA: Union Carbide Canada Limited, Toronto

When inquiring check CP 1392 opposite last page

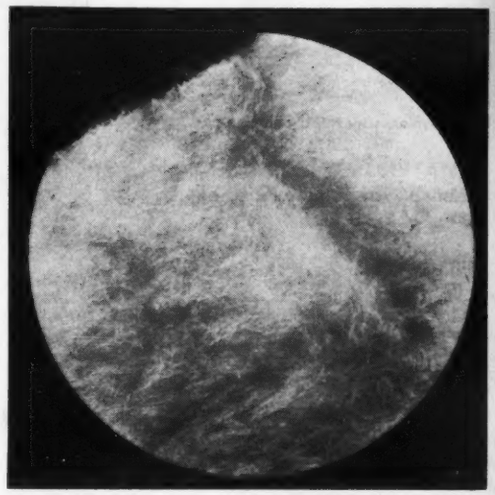
Polyethylene tower packing increases efficiency

Polyethylene tower packing is described in six-page folder. Material was designed for diffusional operations based on principle of holdup of liquid in interstitial spaces rather than holdup on wetted surface of conventional packing. Among the advantages reported are: lighter weight, increased efficiency, and higher capacities.

Folder on Tellerette polyethylene tower packing is issued by The Harshaw Chemical Company, Dept. CP, 1945 E. 97th Street, Cleveland 6, Ohio. When inquiring reader may simply specify CP 1393 on the convenient Reader Service slip which is located opposite last page.

High resistance to acids, bases exhibited by synthetic Dynel filter felts . . .

easy-to-clean cloth has 200-350 psi bursting strength, will withstand temperatures of 170°F



Synthetic filter felts are designed to give greater strength, dimensional stability, smoothness

Uses: Felts are primarily designed for pressure filters and centrifuges.

Features: Material is virtually unaffected by most concentrated mineral acids and bases, and is resistant to variety of organic acids, bases, and salts.

Description: Synthetic filter felts are made of tightly compacted resin-bonded fibers of Dynel. In manufacture, short fibers of Dynel are carded in both directions to give greater strength, dimensional stability, and smoothness. Fibers are treated with polyvinyl chloride binder. After felting, bond is

When inquiring check CP 1394 opposite last page

set under heat and pressure to give a dense, strong, smooth-surfaced cloth.

Felt is easy to clean, will not shrink, can be sealed in press frames without rim cutting. It has bursting strength (wet) of 200-350 psi, and will withstand 170°F. Felt's porosity is such that it will retain fine solids and still permit high filtering rates (water permeability is 7.88 gal per sq ft per minute at 10" water pressure).

(Feon synthetic Dynel filter cloth is product of Filtration Fabrics Division of Filtration Engineers Inc., Dept. CP, 155 Oraton Street, Newark 4, N. J. . . . or for more information check CP 1395 on handy form opposite last page.)

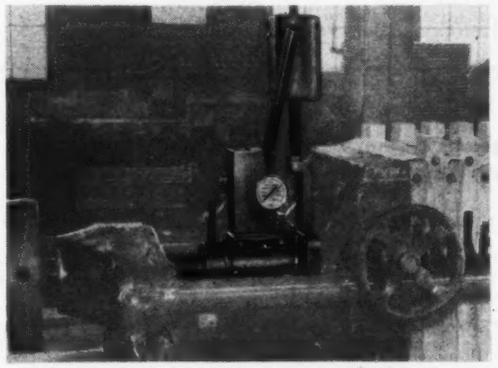
Filter presses close easier with hydraulic device . . .

can be attached to existing units; require no alterations, reboring, or removal of plates

Uses: Closing plate-and-frame filter presses.

Features: Hydraulic power, plus maximum pump leverage and pressure gage control, minimizes labor and increases efficiency of press closings.

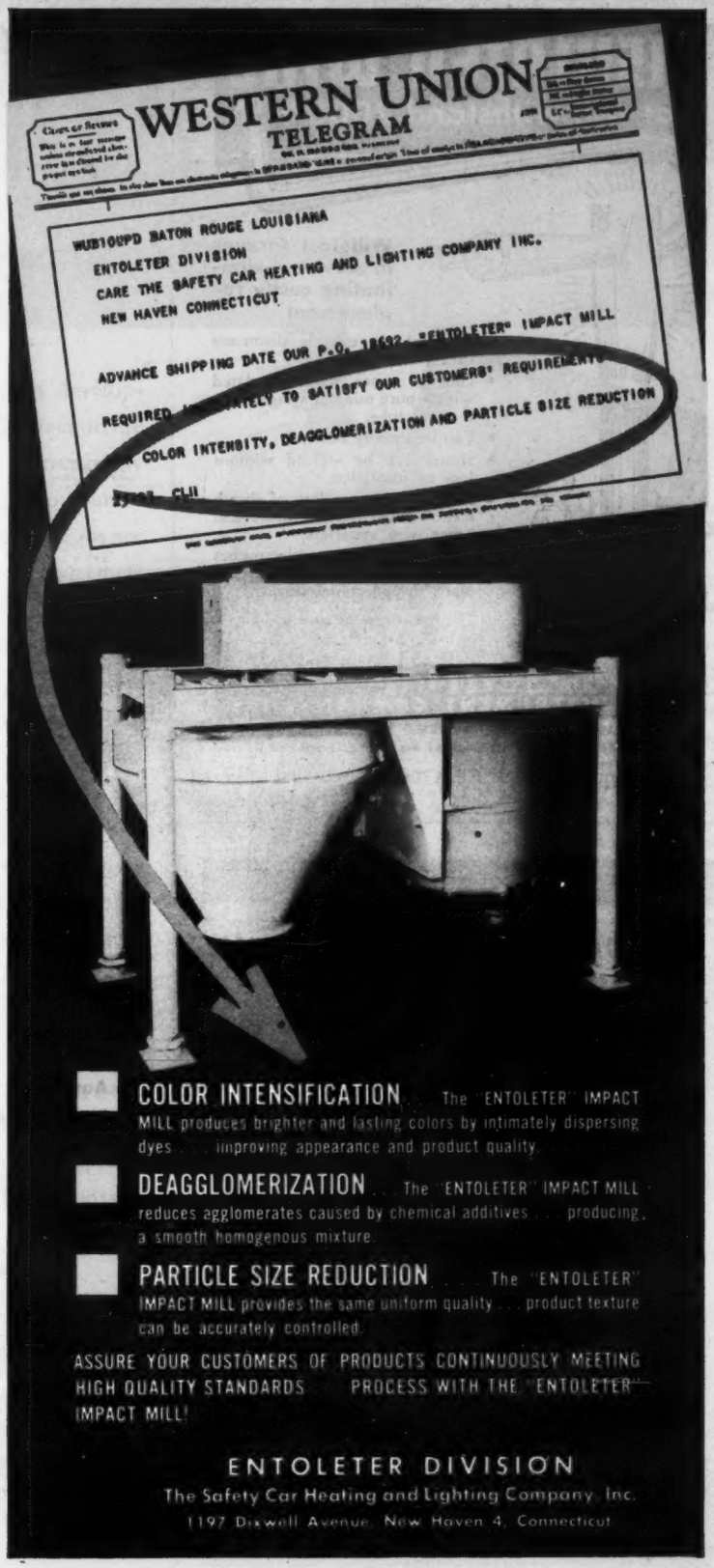
Description: Manually operated hydraulic closing device can be added to existing presses without any alterations, re-borings, or removal of plates. Unit requires no additional support or foundation for mounting. Device replaces filler block and is locked in position with slide head by a cap screw. Weight



Hydraulic device takes work out of closing filter presses

and rod are assembled to filler square. Original closing mechanism remains in position and can be used as stand-by. When cleaning press, device swings horizontally out of position to permit slide head to be moved back, providing maximum working space.

("Handraulic" filter press closing device is product of D. R. Sperry and Company, Dept. CP, Batavia, Illinois . . . or for more information about manufacturer's product reader may simply check CP 1396 on handy form opposite last page.)


WESTERN UNION
TELEGRAM
WU810UPD BATON ROUGE LOUISIANA
ENTOLETER DIVISION
CARE THE SAFETY CAR HEATING AND LIGHTING COMPANY INC.
NEW HAVEN CONNECTICUT
ADVANCE SHIPPING DATE OUR P.O. 18692 "ENTOLETER" IMPACT MILL
REQUIRED
TELY TO SATISFY OUR CUSTOMERS' REQUIREMENTS
COLOR INTENSITY, DEAGGLOMERIZATION AND PARTICLE SIZE REDUCTION
CLU
COLOR INTENSIFICATION The "ENTOLETER" IMPACT MILL produces brighter and lasting colors by intimately dispersing dyes . . . improving appearance and product quality.
DEAGGLOMERIZATION The "ENTOLETER" IMPACT MILL reduces agglomerates caused by chemical additives . . . producing a smooth homogenous mixture.
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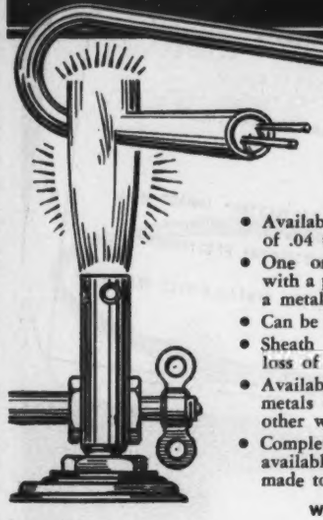
ASSURE YOUR CUSTOMERS OF PRODUCTS CONTINUOUSLY MEETING HIGH QUALITY STANDARDS PROCESS WITH THE "ENTOLETER" IMPACT MILL!
ENTOLETER DIVISION
The Safety Car Heating and Lighting Company, Inc.
1197 Dixwell Avenue, New Haven 4, Connecticut

When inquiring check CP 1397 opposite last page

INSULATED WIRE
that will withstand 2000°F



Will last forever in service—eliminating costly replacement

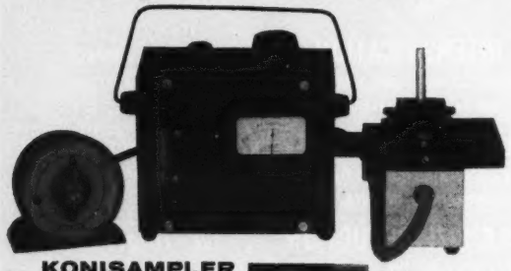
- Available in outside diameters of .04 to .32.
- One or more wires insulated with a pure mineral swaged into a metal tube.
- Can be sharply bent.
- Sheath can be welded without loss of insulation.
- Available in a variety of sheath metals with thermocouples and other wire materials.
- Complete thermocouple probes available using this material made to your requirements.

Write for Bulletin 6

aero research
INSTRUMENT COMPANY, INC.
1040 WEST GRAND AVENUE CHICAGO 22, ILLINOIS
Sales Representatives throughout the United States and Canada

When inquiring check CP 1398 opposite last page

For continuous, and accurate
DUST SAMPLING
with permanent records



KONISAMPLER
(pat. pend.)

Employs principle of thermal precipitation. Light weight — quiet — all electric Automatic timer — will also operate continuously — secures particulate matter suitable for microscopic, electron microscopic or visual and for permanent records on standard glass slides.

Cost (complete) with carrying case $225.00

Send for descriptive literature K-1

Designer and manufacturer of continuous gravimetric and oscillating types of thermal precipitators

JOSEPH B. FICKLEN III
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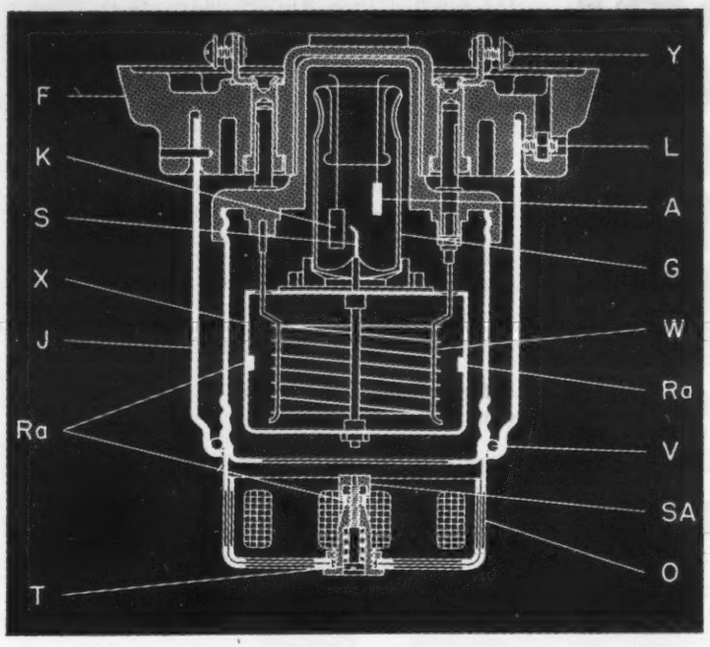
Pasadena 7, California

When inquiring check CP 1399 opposite last page



Cross-sectional view of detecting device

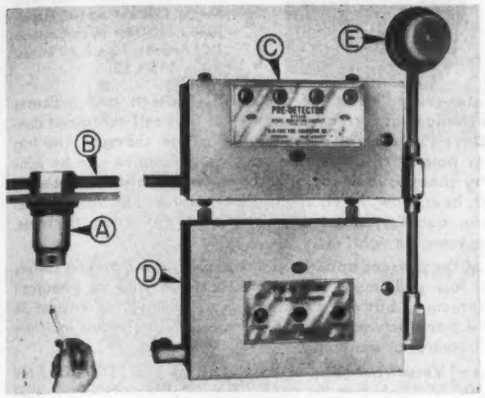
O—chamber exposed to atmosphere
X—chamber virtually sealed from atmosphere
Ra—radioactive material
SA—sensitivity adjustment cap
T—sensitivity adjustment screw
G—gas discharge (cold cathode) tube
A—anode
K—cathode
S—starter electrode
W—inner wire grid electrode
J—locking shell
V—O-ring
F—socket base
L—locking set screw
Y—terminal screws

Automatic fire guard system employs radioactive material to . . .

detect fire in incipient period —keep damage to a minimum

Detector reacts to invisible combustion gases as well as smoke, independently of the presence of flames or rise in temperature

MANIFESTATIONS of a fire in ordinary combustible materials usually appear in the sequence of first, combustible gases, then smoke, followed by flame and heat. Many fires develop through the first two stages over a considerable length of time which is known as the incipient period. Detection must occur during this incipient period if damage is to be kept to a minimum. In many instances, this slow smoldering condition will continue until a window or



Pre-detector system, here being activated by cigarette smoke, has three principal units: pre-detector head (A), space indicating cabinet (C), and fire indicating cabinet (D). Electrical conduit (B) and alarm bell (E) complete assembly. Space indicating cabinet, which may be used when two or more pre-detector heads are installed, shows location of fire in building, while fire indicator gives visual alarms for fire, power failure, or system disturbance

door is opened. Admission of fresh air at this time produces a sudden burst of flame that generates intense heat.

A detecting system depends, for its operation, upon a rise in air temperature that can only give a signal after the fire is well established. On the other hand, a detector system that will detect combustible gases and smoke will minimize the damage.

Detecting fires in the earliest stages, without dependence on invisible smoke or heat for actuation, is now possible by means of a newly developed radioactive, automatic pre-detector system which gives visible and audible alarms within seconds after ignition of various type fires.

With pre-detector heads, containing the radioactive element, spaced on centers up to 60 feet apart or up to 30 feet from side walls, system can quickly detect smallest smoldering fire and indicate the location.

Heart of this pre-detector system is an overhead detection device electrically connected to a fire indicating cabinet. Each of these detector heads contains a highly sensitive gas discharge (cold cathode) tube, plus two independent chambers, one of which is exposed to the atmosphere and the other virtually sealed from the atmosphere. A minute source of radioactive material is mounted in each of these chambers, and the radiation ionizes the air in the respective chambers, causing it to be electrically conductive.

Each chamber is adjusted to give equal voltage when combustion gases or smoke are non-existent. However, when combustion gases or smoke are present the balanced condition is upset. Chamber exposed to

(*Continued on next page*)

STEEL-GRIP SAFETY APPAREL

. . . and the Chemical Processing Industries

Steel-Grip constantly keeps abreast of developments in chemical processing, for their effect on the safety of chemical workers. And we as constantly develop new materials and new designs to counter these risks. Some of the latest Steel-Grip designs are shown on this page; they have proved extremely effective wherever they have been used.

We also believe it important to you that Steel-Grip has been designing and manufacturing a broad line of safety apparel since 1910. This has given us an enviable entree into hundreds of the largest plants of every type—an experience of untold value to any buyer or user of safety apparel. We have always emphasized quality because in our experience it gives the greatest satisfaction and value and always works out at the lowest man-hour cost of protection. Quality manufacture is standard practice here. As a result, our prices are frequently no higher than for inferior merchandise.

We manufacture a complete line of safety apparel to meet every type of need. We suggest you send for our catalog and at the same time tell us your specific needs. No obligation of course. But write today.

Amazing New

JAXCOLITE*

SAFETY GARMENTS

Amazing new compound fully tested and approved. Asbestos or duck garments coated with Jaxcolite fully protect anybody from acids, caustics, molten metal splash, heat, oil or water. Nothing to compare. Users refuse to buy anything else. Long wear. Low cost. Flexible, comfortable, good looking. Coats, pants, aprons, sleeves, leggings, spats, curtains, gloves and mitts with Jaxcolite backs.

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DYNEL CLOTHING

Steel-Grip makes a line of coats, pants, shirts, laboratory coats from Dynel cloth, known to be resistant to a wide range of chemicals. Good-looking, neat, long-wearing. Will withstand many, many launderings. Special designs to order.

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Steel-Grip manufactures a complete line of safety apparel from Jaxcolite, Dynel, Leather, Duck, Wool, Asbestos, Perma-Proof, Aluminum-coated materials, etc. for every possible safety need. No matter what you require, contact Steel-Grip Industrial. Write for catalog today.

INDUSTRIAL GLOVES COMPANY

TO BE SURE OF THE GENUINE

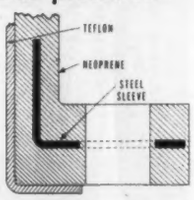
When inquiring check CP 1400 opposite last page

DORE'S NEW TEFLON LINED EXPANSION JOINTS

WITHSTAND TEMPERATURES TO 425°F. PRESSURES TO 150 P.S.I.

Extensive tests by Doré prove that unsupported TEFLON Bellows and Expansion Joints are not successful at temperatures above 150°F. — pressures over 50 p.s.i.

To overcome this problem, Doré has developed, and recommends, expansion joints and bellows of Neoprene or high temperature rubber lined with TEFLON. Thus supported, TEFLON can be successfully used at higher temperatures and pressures.



An L-shaped steel sleeve imbedded in the duck and Neoprene prevents distortion of the flange, transmits pressures directly to the TEFLON extending over flange face to assure a flange-to-flange seal that defies leaks.

This new combination gives you a leakproof bellows that incorporates the advantages of TEFLON with the pressure-and-temperature resistant advantages of Neoprene or high temperature rubber.

THERE IS A BELLOWS AND EXPANSION JOINT TO FIT YOUR REQUIREMENTS.

TEFLON Lined Neoprene Expansion Joint
Style E-B-N
150 p.s.i. -250°F. Sizes 1" through 20"
TEFLON Lined Neoprene Expansion Joint
Style E-B-NV
150 p.s.i. or 28" vacuum at 250°F. Sizes 1" through 20"
TEFLON Lined Rubber Expansion Joint
Style E-B-NT
150 p.s.i. — 425°F. Sizes 1" through 20"
TEFLON Lined Neoprene Bellows
Style E-B-NM
100 p.s.i. — 150°F. Sizes 1" through 20"
TEFLON Lined Rubber Bellows
Style E-B-NMT
100 p.s.i. — 400°F. Sizes 1" through 20"

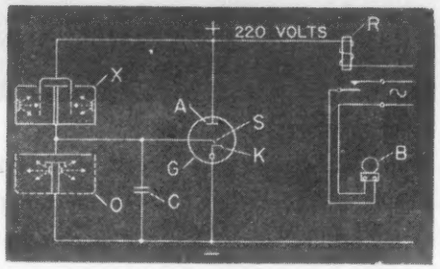
John L. Doré Co.

SALES AGENTS IN U.S.A. FOR JOHN L. DORE, INC.
Du Pont's Teflon • Kellogg's Kel-F • Hi-Quality Nylon
P. O. BOX 7772 • HOUSTON 7, TEXAS

When inquiring check CP 1401 opposite last page

FIRE DETECTION

(Continued from preceding page)



Circuit diagram illustrates the working of the pre-detector system. Chamber (O) exposed to the atmosphere is adjusted to give a voltage equal to that of the chamber (X) virtually sealed from the atmosphere when combustion gases or smoke are non-existent. Radiation from a minute radioactive source in each chamber make both chambers electrically conductive. When smoke or combustion gases are present, the chamber exposed to the atmosphere is affected, and the electrical "unbalance" causes the gas-discharge (cold-cathode) tube (G) to become conductive, operating an alarm relay (R), which can sound an alarm bell (B). Parts of the gas-discharge tube indicated in the diagram are the anode (A) cathode (K), and started electrode (S). The trigger capacitor (C) is also shown

atmosphere rapidly changes its condition, causing tubes to become electrically conductive, which in turn operates relay in a space indicating cabinet, if used, or the fire indicating cabinet.

Pre-detector head is designed to be attached to a standard four-inch round electrical conduit box and each one can be adjusted to its own sensitivity without affecting the others in the circuit. As many pre-detector heads as necessary can be connected together in a single two-wire circuit to the fire indicating cabinet.

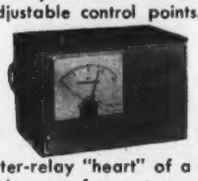
With a single circuit, detector pre-heads are connected directly to the fire indicating cabinet. When combustion gases or smoke are present, relays in the fire indicating cabinet function to sound alarms, close fire doors, activate fire extinguishing systems, or perform other fire protection functions.

Where it is desirable to know the location of the fire, a space indicating cabinet can be connected through separate circuits, each circuit containing the necessary number of heads to cover specified areas. Up to four separate circuits can be connected to one space indicating cabinet and four of these can be connected to the fire indicating cabinet, making a total of 16 separate circuits or spaces being handled by one system.

Space indicating cabinet shows visually by number

Versatrol Indicating Controller

For any variable that can be measured electrically. Adjustable control points. . . . automatic operation.



Catalog No. 3561 Versatrol (High Limit Automatic) with Single Contact 451-C Meter-Relay (0-20 Microamperes DC) Approx. 10 x 6 x 7 inches. Price $154.25.

The meter-relay "heart" of a Versatrol detects and indicates minute changes of current or voltage. It trips self-contained control relays (5 Ampere) as a result of these changes. The trip point or points are adjustable. This control action can be initiated by changes in linear or rotary speed, radiation, moisture content, heat, flow, level, electrical resistance—or variations in pressure, quantity, stress or strain, load, deflection, thickness, weight, color, or light, etc.

Some of the present applications are: Monitoring milling cutters (a dull tool pulls more load); automatic pH alarm; photocell light detectors; battery charger control; control of vacuum in TV tube manufacturing; conveyor belt speed control; moisture content control or warning.

Ranges of Versatrol Meter-Relays: 0/20 Ua to 0/50 A, 0/5 Mv to 0/500 V. Dials can be calibrated in any units—rpm, foot candles, feet-per-minute, counts per minute, deflection, deviation, etc. Signal input may be either AC or DC. Control sensitivity may range from 0.2 microamps to 1000 amps, or 0.1 mv. to over 500 volts. Shunts, series resistors and current transformers can be used in input to extend sensitivity range. Control can be high limit (on an increase in signal), low limit (on a decrease in signal) or double (control action on rise or fall of signal). Versatrol can be used for continuous on-off control (automatic) or for shut-down or alarm (requiring manual reset). No vacuum tubes are used. Write for Bulletin G-7. Assembly Products, Inc., Chesterland 36, O. Or phone our Versatrol Department: (Cleveland, O.) HAmilton 3-4436.

Booths 425-426, Automation Show, Nov. 14-17, Chicago

When inquiring check CP 1402 opposite last page

...Use the Right Tools For Your Job... PIONEER's

"Hand Protection Clinic" Helps You Solve Your Industrial Glove Problems

Send a complete job description on your company stationery. Include dexterity and abrasion resistance requirements, and a complete description of chemicals or solvents used; plus notes on any extreme temperatures encountered. Our solution of your glove problem assures you of maximum employee protection and efficiency at minimum cost. Write—Attn: Hand Protection Clinic.

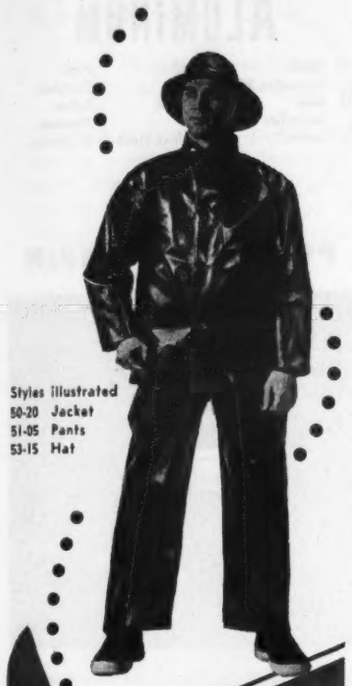
New knit cotton lined Stanflex VL-34 with its highly flexible red vinyl coating features PIONEER's exclusive non-slip grip. Outwears leather on rough abrasive use yet withstands most industrial chemicals. Write for complete PIONEER line catalog today.

the PIONEER Rubber Company
241 Tiffin Road, Willard, Ohio, U. S. A.

Pioneers in Industrial Hand Protection for over 35 Years

When inquiring check CP 1403 opposite last page

Designed for
PROTECTION



Styles illustrated
50-20 Jacket
51-05 Pants
53-15 Hat

BUILT FOR WEAR

Sawyer's "FROG" ® BRAND
CLOTHING
can take it!

Tough — wears like iron, takes endless snagging, scraping, chafing and still gives full protection.
Rotproof — not affected by oils or chemicals — will not blister, crack or peel.

Waterproof — made with top quality base fabric, first saturation-coated, then coated on the inside as well as on the outside with specially blended Neoprene Latex.

Many styles — in black, yellow or Hunter's green
Write for catalog

THE H. M. SAWYER & SON CO.
Cambridge, Mass.

When inquiring check CP 1404 opposite last page

the area affected and it contains relay contacts which will shut down ventilation, activate fire extinguishing systems, or perform other functions in the effected areas.

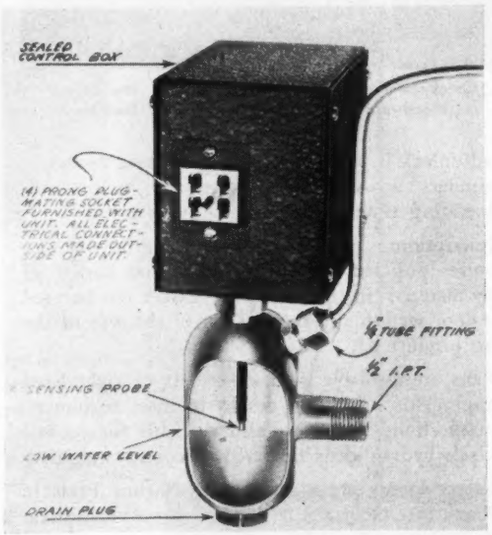
(Pre-detector system is a product of Pyrene C-O-Two, Dept. CP, U. S. Highway 1, Newark 1, N. J. . . . or for more information check CP 1405 on handy form opposite last page.)

Develop floatless level control with sealed control box . . .

unit is intended for boiler pump control, cutoff, and alarm

Floatless level control is an adaptation of probe level control units. It is easily installed and has a power requirement of 110 volts. By means of transformer contained within sealed control box, all signal voltages are reduced for elimination of any electrical hazard.

Electrical hookup is safe and simple through use of a four-prong plug and socket arrangement furnished.


SEALED CONTROL BOX
(4) PRONG PLUG-MATING SOCKET FURNISHED WITH UNIT. ALL ELECTRICAL CONNECTIONS MADE OUTSIDE OF UNIT.
¼" TUBE FITTING
½" I.P.T.
SENSING PROBE
LOW WATER LEVEL
DRAIN PLUG

Vessel containing probe is marked externally to show low water level. As long as tip of sensing probe is immersed in water no action is called for. When water level falls below probe tip then control and/or alarm action is called in via relay contained in the sealed control box. Unit is designed to act in a fail-safe manner.

Where a controlled level range is required and difference between high-low levels does not exceed six inches, two probes are furnished in one vessel.

(Level control is a product of The Techniflex Corp., Dept. CP, 55 Jersey Ave., Port Jervis, New York . . . or check CP 1406 opposite last page.)

Scott Air-Paks
Cut Repair and Maintenance Costs, Safely!

SAVED
from
Complete Plant Evacuation and Production Shut-Down

• This manufacturer of a chemical product had too many costly experiences resulting from leaks of ammonia and chlorine. It meant complete evacuation of personnel, opening windows to lower gas concentrations and prolonged attempts to fix the leaks by workers wearing inadequate cannister masks. Repair work was painfully slow because repairmen had to make frequent trips to windows for fresh air. It was a costly procedure.

Now — equipped with Scott Air-Paks, repairmen are able to make quick repairs with complete breathing safety. Evacuation of personnel is unnecessary. Result: no lost time — no production losses. The Scott Air-Paks have paid for themselves many times over!

Do you have a similar problem? Then write for the free booklet "Scott Air-Paks Save Money, Man Hours and Men for Industry."

On Hazardous Jobs Scott Air-Paks Help Management and Labor Breathe Easier

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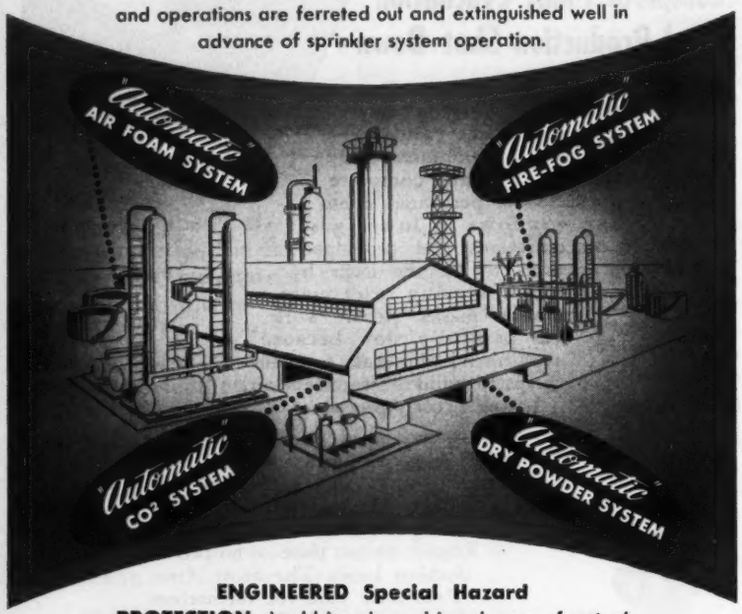
FOR SAFETY—FOR SERVICE
SAFETY EQUIPMENT DIVISION
SCOTT AVIATION CORP.
242 ERIE STREET **LANCASTER, N. Y.**
Canada: Safety Supply Co., Toronto — Branches in principal cities
Export: Southern Oxygen Co., 15 West 57th Street, New York 19, N. Y.

When inquiring check CP 1407 opposite last page

"Automatic" Sprinklers -PLUS-
ENGINEERED Special Hazard PROTECTION

While "Automatic" Sprinklers are generally conceded to be industry's most effective weapon against fire, production methods and occupancy hazards in most manufacturing plants are undergoing constant change. For example: An improved system for paint application or metal de-greasing can increase the hazard of fire a hundred fold. And, standard sprinkler protection may not be enough to detect fire fast . . . extinguish fire instantly.

That's where "Automatic" Sprinkler's ENGINEERED Special Hazard PROTECTION enters the picture. Employing such accepted methods of fire extinguishment as **FIRE-FOG, AIR FOAM, CO^2 and DRY POWER,** with fixed temperature, Rate-of-Rise, flame, smoke, flash or vapor detection—hidden and inherent fires of materials and operations are ferreted out and extinguished well in advance of sprinkler system operation.



ENGINEERED Special Hazard PROTECTION should be planned in advance of actual plant production, and the proper safeguard incorporated in the design or set-up of the equipment. In this way, out-of-service time and costly future alterations can be eliminated.

"Automatic" Sprinkler maintains a staff of Special Hazard ENGINEERS within easy reach of the 48 States and many foreign lands. Consult them in advance. They can help you to minimize fire loss and avoid costly shut-downs.

"Automatic" Sprinkler
CORPORATION OF AMERICA
YOUNGSTOWN, OHIO
Offices in Principal Cities of North and South America

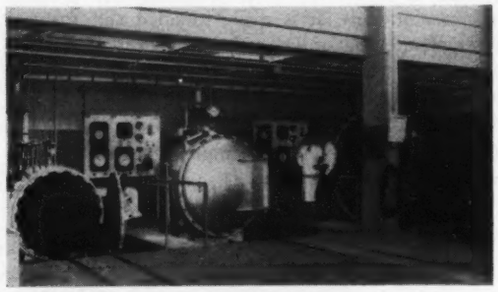
When inquiring check CP 1408 opposite last page

Allows safe opening of pressurized vessels

Valve and lock keep door closed except at zero pressure

Uses: For safe opening of pressure and vacuum vessels ranging from 18 inches to 10 feet in diameter.

Features: Safety valve and lock prevents door from being opened except at zero pressure. Lock



Quick-opening safety doors in use at the Stowe-Woodward Company plant in Griffin, Georgia

and unlock is by means of double-acting hydraulic cylinders, actuated by a pump and motor unit. Operating time either way is five seconds.

Description: Tapered tongue and groove design assures positive seal on square-section gasket of any material; in chemical field, gasket can be used in door section and thus be out of the way of the end product.

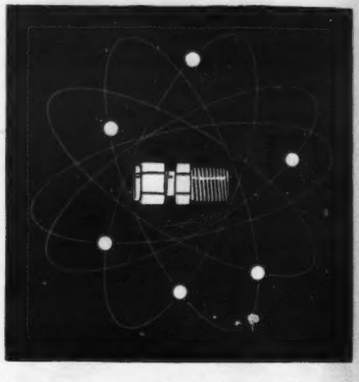
Doors are available with either left or right hand hinging, or a hinging design to meet customers' specifications. Doors are also available for vertical vessels hydraulically operated or counterweighted.

(Safety Doors are a product of Anchor Pressure Doors, Inc., Dept. CP, 1674 Kenmore Ave., Buffalo 23, N. Y. . . . or for more information about manufacturer's product reader may simply check CP 1409 on handy form which is located opposite last page.)

Have a safety problem . . .?

the handy Product Directory (pages 255 to 259 in this issue) is your guide to equipment and ideas which may suit your needs.

NOW Swagelok®
TUBE FITTINGS FROM
ALUMINUM
Brass, Carpenter 20, Gold, Hastelloy, Inconel, Monel, Nickel, Platinum, Silver, Stainless Steel, Steel, Tantalum, Teflon, Titanium, Zirconium
TO
ZYTEL*
POLYAMIDE RESIN



From aluminum to "Zytel" there's a Swagelok answer to your fitting problems. The new Swagelok Tube Fittings of "Zytel" are for use with plastic tubing in applications where corrosion is a problem. They are the first to be made in a complete range of shapes that include elbows, tees, reducers and adapters.

The new Swagelok Tube Fittings of "Zytel" are made to the unique Swagelok patented design that provides strong, torque-free and leakproof joints at all tubing connections. Sleeves or inserts are unnecessary. Specify Swagelok for every fitting need and eliminate unnecessary fitting problems.

FREE: For complete information write for the Swagelok catalog. Address Dept. C4

Swagelok Tube Fittings Are
Easy to Use
No Special Tools Needed
No Flaring or Threading

*DuPont trade-mark

CRAWFORD FITTING CO.
884 E. 140th Street
Cleveland 10, Ohio

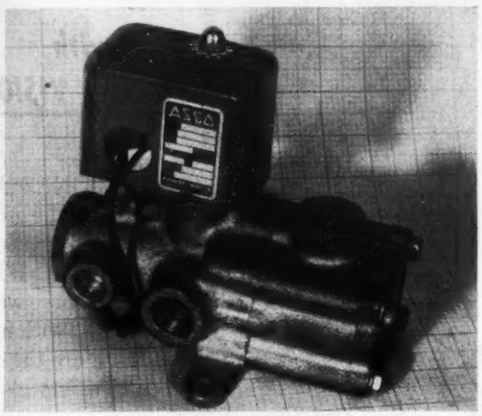
When inquiring check CP 1410 opposite last page

Spring action is eliminated, moving parts cut to three in solenoid valve . . .

valve designed to eliminate piston malfunction due to binding or residual magnetism

Designed to eliminate piston malfunction due to binding or residual magnetism and to provide greater safety, minimized leakage and cycling rates up to 150 per minute, four-way poppet valve has been developed for hydraulic and pneumatic systems.

Valve is power-operated in both directions. Spring action has been eliminated entirely. There are only three moving parts. Valve is available as either single or dual solenoid, depending upon electric circuit involved. Dual valve has additional safety advantage of locking into position on power failure.



Solenoid valve with high cycling rate of 850 per minute provides many safety features. It is power-operated in both directions

Design principle eliminates leakage factor inherent in slide or spool valves and assures tight seating. Pressure on valve discs forces them against metallic junction of the disc and seat in an effective seal. Seating is primarily metal-to-metal, thus reducing service problems of O-ring wear and replacement.

Dual solenoid valve maintains position of valve piston regardless of any leakage which may take place at flange joint or seat by keeping pressure on large end of cylinder. No continual bleed is necessary for locking valve in position.

Unit is designed to operate in any position and on all standard voltages. Power consumption is 10 watts. Standard, water-tight, or explosion-proof valve models can be supplied. Dual solenoid valve is built to withstand pressures up to 500 psi, the single to 250 psi. At present, ⅜, ½, ¾, and 1" sizes are available. Cycling rate is 850 per minute.

(Valve 8344 is a product of Automatic Switch Co., Dept. CP, 391 Lakeside Ave., Orange, N. J. . . . or check CP 1411 opposite last page.)

There may be good news soon for the working girl who is exposed in the course of her job to corrosive materials. In the past she had to wear heavy protective garments—or else risk damage to her regular clothing.

Now a new coating for nylon fabrics has been developed. It makes these light, attractive fabrics highly resistant—yet they retain their pleasing handle and drape. They also show unusual freedom from cracking or crazing when creased—even at very low temperatures.

This remarkable, patented* film is produced by applying a composition of several organic chemicals, including an organic polyisocyanate and a polyester of *Glycerine*.

The unique balance of properties that won such wide acceptance for Glycerine in the past continues to open new doors to chemical progress. In paints, foods, pharmaceuticals, packaging . . . for tomorrow's surge of new specialties . . . in formulations and reactions yet unknown, nothing takes the place of Glycerine.

* U. S. Patent No. 2,676,164

This balanced group of properties keeps Glycerine's usefulness growing

HYGROSCOPICITY • STABILITY • HUMECTANT •
SOLVENT POWER • VISCOSITY • NONVOLATILITY • CARRIER • SOLVENT • LUBRICANT • SOFTENER •
NONTOXICITY • TASTE • MW/HYDROXYL RATIO • EMOLLIENT • ANTI-FREEZE • ALKYD BASE •

☑ CHECK AND SEND FOR TECHNICAL DATA

☐ 20-page booklet on Glycerine for product conditioning

☐ 8-page folder, "Federal Specifications — Glycerine."

☐ 16-page booklet on Glycerine properties and applications

For your free copy of any or all of these booklets write: GLYCERINE PRODUCERS' ASSOCIATION • 295 Madison Ave., New York 17, N. Y.

When inquiring check CP 1412 opposite last page

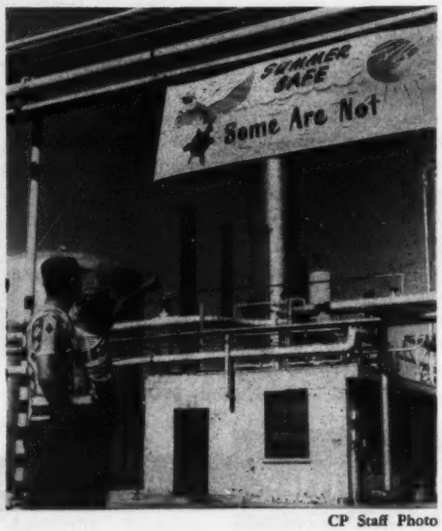
Presents 36-page guide for audio technicians

Brochure of 36 pages is designed as a teaching aid and a source of information to enable the technician to deal more effectively with the new problems of industrial hearing conservation.

Included in the guide is brief background material on physics of sound and the anatomy and physiology of the ear. Guide is not intended to be a complete textbook in audiology but is a good introduction to the subject.

Theory is held to a minimum and emphasis is on techniques for measuring hearing. Guide is well illustrated and has a bibliography of reference material on the subject. Also included is a suggested training program in industrial audiometry.

"Guide for Industrial Audiometric Technicians" is available from the Employers Mutuals Liability Insurance Co. of Wisconsin, Dept. CP, Wausau, Wisc. When inquiring specify CP 1413 on handy form opposite last page.



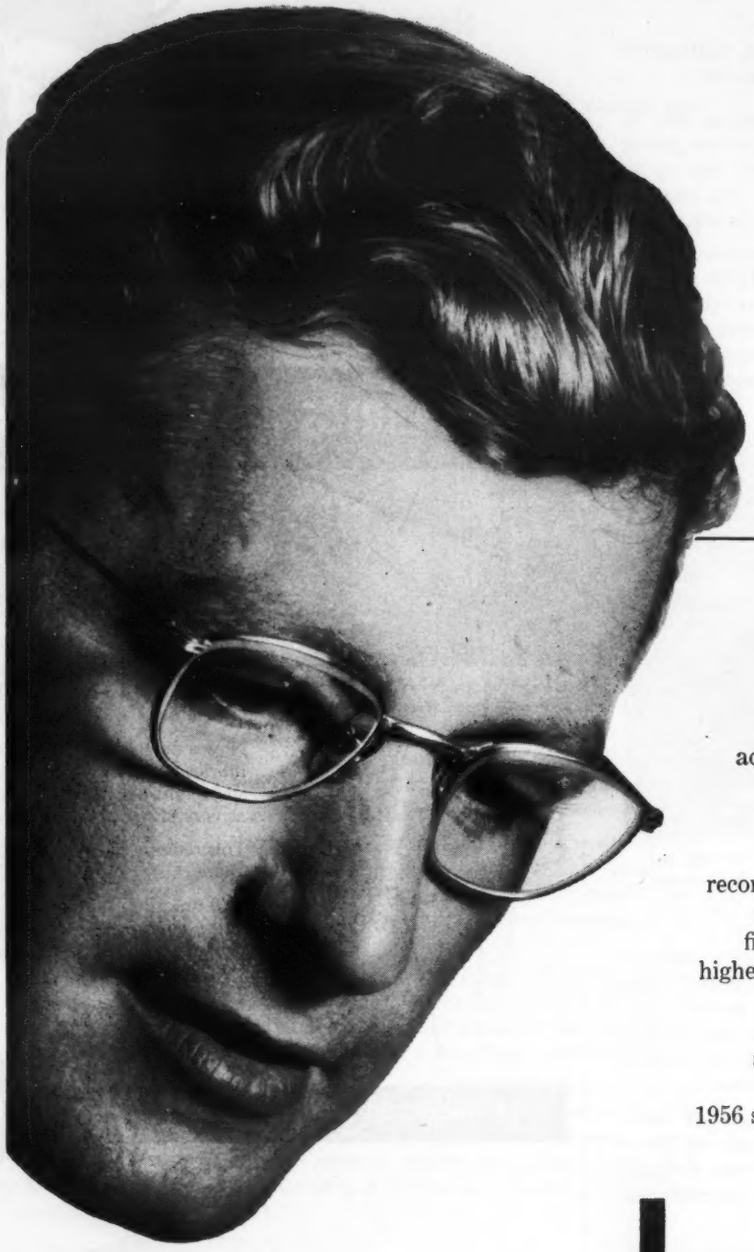
CP Staff Photo

Socony Mobil makes it profitable to remember safety slogans

"Now that our employees are safer on the job than at home, we're trying to make his family safety conscious too," says John DuFon, Safety Director at Socony Mobil Oil Company's East Chicago, Indiana, refinery. DuFon is doing this in a way that not only makes it easy — but also profitable.

About one week after a new slogan is posted over refinery's main gates, DuFon calls homes of employees. If their family knows the slogan, they can choose among a nice selection of useful prizes.

An Evolution in



Yes this is a Safety Goggle! ...it's the NEW AO† F5100 (METAL)

Both with "ULTRASCOPIC VISION"

NEWLY DESIGNED AND ENGINEERED "from the ground up" . . . with greater protection than ever . . . greater field of vision than ever . . . more wearer acceptability than ever . . . with many new features — these are the most advanced of safety glasses.

The safety director who recommends these AO safety glasses rests assured that he has selected the very finest — with lenses and frames of the highest quality and ophthalmic standards. Yes, and in addition he obtains true economy because structurally these safety goggles are *engineered, designed and made to last longer!* These new 1956 styles will be in complete supply soon and will replace predecessor models.

Always insist on AO Trademarked Lenses and Frames

SOUTHBRIDGE, MASSACHUSETTS

American Optical

SAFETY PRODUCTS DIVISION

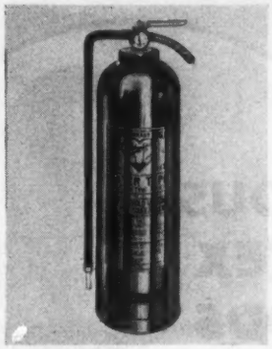
BRANCHES IN PRINCIPAL CITIES

in Eye Protection!

† T.M. Reg. by American Optical Company

When inquiring check CP 1414 opposite last page

Extinguisher using only air pressure instead of cartridge charge is UL-approved



UL-approved fire extinguisher for Class A-1 fires

Uses: For class A-1 incipient fires, which covers such items as wood, cloth, paper, and rubbish.

Features: On-the-spot recharging is done by merely replacing water and pressurizing by air.

Description: Extinguisher is constructed of seamless brass drawn shell with all-brass forged parts. To operate extinguisher, valve is pulled and handle is squeezed. Valve control permits stream to be turned on or off, conserving water and eliminating excess water damage. Chemical damage is held to a minimum as water is the only extinguishing agent used.

Pressure gage indicates if extingusher is ready for action. When gage arrow is on green dial section, extinguisher is ready. Arrow in red section indicates need for simple servicing with air pressure and water. No bumping or inverting is required; it can be held or placed on floor to operate. Capacity of unit is 2½ gallons of water, and it will maintain a steady stream length of from 35 to 40 feet until water supply is exhausted with no dripping or drop-off of stream. It has a removable fill tube with anti-overfill feature. Unit can also be supplied with an antifreeze charge.

(Elk-Air is a product of Elkhart Brass Mfg. Co., Inc., Dept. CP, Elkhart, Indiana . . . or for more information check CP 1415 on handy form opposite last page.)

Flame retardant coating for roofing described

One-page technical data sheet describes two chlorinated paraffins used in producing flame retardant coatings. Six typical formulations using the two materials are provided. With this material Gilsonite coatings can be prepared which will not maintain a flame or flow from vertical surface as will ordinary Gilsonite coatings without these materials.

Data on Chlorowax-Gilsonite coatings are issued by Diamond Alkali Co., Dept. CP, 300 Union Commerce Bldg., Cleveland 14, Ohio. When inquiring specify CP 1416 on handy form which is located opposite last page.

CESCO *RIGHT... before your Eyes!*

FAMOUS ACITEX HOODS

No. 732

• Acitex hoods thoroughly cover the head, chest and shoulders and allow no gaps for acid penetration. They provide the utmost protection from caustics, acids and splashing liquids. Acitex material is highly resistant to corrosive and harmful reaction of caustic soda, nitric, sulphuric, hydrochloric and hydrofluoric acids. Model shown is fresh air supplied for use in extremely hazardous fume conditions.

No. 748

Snap-Fast Face Shield with Deflector Crown

• Here's a CESCO face shield that offers greater protection with more comfort. Tough, plastic windows, extending well beyond the ears, protect face and neck. Clear Vinyl windows are recommended where splashing acid is involved. Fiber deflector half crown protects fore part of head. Crown and window tilt as a unit.

No. 99 Approved CESCO Respirator

• A twin cartridge organic vapor respirator (BM Approved) with positive acting inhale-exhale check valves which prevent rebreathing. Easy to install new cartridges. Converts to No. 96 (BM Approved) CESCO Dust Respirator by changing cartridges to filter pads. Buy one respirator with cartridges and filters for dual service.

CHICAGO EYE SHIELD COMPANY • 2316 Warren Boulevard, Chicago 12, Illinois

CESCO FOR SAFETY

OFFICES IN: Atlanta, Birmingham, Boston, Buffalo, Cincinnati, Cleveland, Columbus, Dallas, Detroit, East Orange, Houston, Indianapolis, Kansas City, Knoxville, Little Rock, Los Angeles, Louisville, Mexico City D.F., Milwaukee, Montreal, Peoria, Philadelphia, Pittsburgh, Salt Lake City, San Francisco, Spokane, St. Louis, St. Paul, Toledo, Tulsa, Wichita

When inquiring check CP 1417 opposite last page

Gives quick "go, no-go" check for combustible gases . . .

pocket-size indicator operates on two small pen light batteries

Uses: For quick indication of combustible gases or vapors in manholes, tanks, tankcars, etc.

Features: Indicator is self-contained, operating on two small pen light batteries.

Description: To use gas indicator, operator merely removes indicator from its plastic case and presses light bulb. When switch is on, bulb glows dimly. If there is trace of combustible gas or vapor

Explosive gas indicator about the size of a fountain pen, gives quick indication of dangerous atmospheres

in atmosphere, light begins to flash intermittently. As concentration of combustibles increases, flash becomes more rapid, until steady bright light indicates atmosphere is hazardous.

(Indicator is a product of Davis Emergency Equipment Co., Inc., Dept. CP, 47 Halleck St., Newark, N. J. Check CP 1418 opposite last page.)

Develop heat-resistant decals for many applications

Uses: For exhaust pipes, hot pipes, electronic equipment, jet aircraft fuel lines and other extreme heat applications.

Features: Besides being heat-resistant, decals also are able to resist active solvents.

Description: There are three heat-resistant decal types which are available in virtually any color combinations desired. These are:

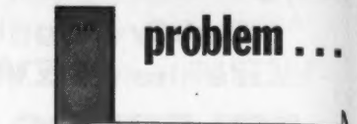
Type HR (Heat Resistant) — Temperature range in neighborhood of 400°F. Suitable for most surfaces which will take this heat.

Type SHR (Sustained Heat Resistant) — temperature range, constant operating, 500 to 600°F. Smooth rigid surfaces required.

Type HHR (High Heat Resistant) — Temperature range, intermittent, up to 1000°F. Rigid surfaces. Some color limitations.

(Decals are product of The Meyercord Co., Dept. CP, 23 W. Lake St., Chicago 44, Ill. . . . or for more information check CP 1419 opposite last page.)

At the center of your SEPARATION problem . . .



MERCO

The Merco continuous separation of liquids and suspended solids offers these advantages to the chemical processing industry:

MERCO Flexibility
Simple external regulation on a Merco centrifuge permits instant control and maximum flexibility.

MERCO Counterflow Feature
Merco's unique counterflow principle, using a return flow, enables you to—

- **Classify fine solids**
- **Wash minute particles**
- **Recover solubles**

MERCO Versatility
The outstanding and unusual features of a Merco Centrifuge permit a great variety of operations — clarification (solids removal), soluble recovery, classification, concentration, and washing.

MERCO Centrifugal Co.
AFFILIATE OF THE MERRILL COMPANY
150 Green Street, San Francisco, California

When inquiring check CP 1420 opposite last page

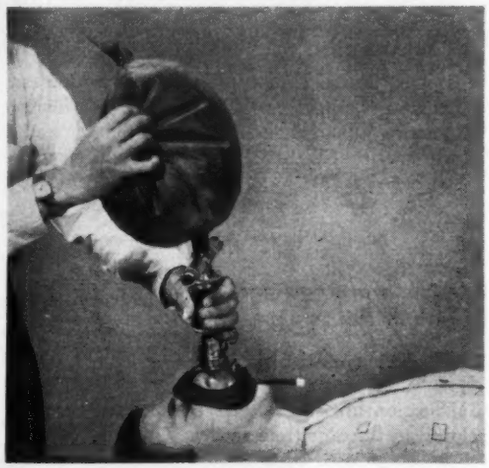
Anesthetizer, resuscitator and inhalator weighs only one pound . . .

is extremely durable and has no delicate parts or complicated flow meters

Uses: As an anesthetizer or as a resuscitator in cases of fainting, apnea, drug sensitivity, etc. Also as an inhalator for use by patients in hypoxic atmospheres.

Features: Unit weighs just over one pound, is compact, durable, and easy to handle.

Description: Portable resuscitator and anesthetic gas machine was developed in cooperation with the Department of Anesthesia, Western Reserve University. With use of unit and cyclopropane-helium cylinders, 3 to 6 breaths produce loss of consciousness. 12 to 20 breaths produce surgical anesthesia (3rd stage, plain tube).



Portable anesthesia machine, resuscitator and oxygen inhalator weighs only one pound. It is an extremely rugged unit and has no delicate parts or complicated flow meters

Anesthesia can be maintained for 20 minutes or longer by metering cyclopropane and adding minute volume requirements of oxygen from wall or reservoir supply.

Replacement cylinders are packaged 24 to a carton and weigh just over one pound. Specially designed cylinder head prevents inadvertent perforation of anesthesia gas on oxygen side. Also gas mixture is dampened to prevent explosion by electrostatic spark ignition.

(Reserve Midget, portable anesthesia machine, is a product of Z&W Machine Products, Incorporated, Department CP, 5100 St. Clair Avenue, Cleveland 3, Ohio . . . or for more information about manufacturer's product, reader may simply check CP 1421 on the handy form which is located opposite last page.)

Ansul Dry Chemical Piped Systems Now U.L. Approved For Industry-wide Use

For the first time, Automatic Dry Chemical fire protection for class B and C hazards

The science of fire protection took a big step forward when Ansul's *Dry Chemical Piped System* was approved by Underwriters' Laboratories. Eight years of development and field application made this important approval possible.

Ansul's Dry Chemical Piped Systems provide instant, around-the-clock protection for such hazards as paint dip tanks, spray booths, generators, flammable liquid pumping stations, exhaust ducts—wherever there is a hard to reach or highly flammable stationary installation.

Automatic or manual systems, or a combination of both, are available. Also, by using automatic selector valves, one piped system can protect two or more separate hazards.

Protecting a hazard with an Ansul Dry Chemical Piped System will, in most cases, result in increased insurance savings. Protect your business, safeguard your investment, get in touch with your Ansul Man today.

LISTED UNDER REEXAMINATION SERVICE UL UNDERWRITERS' LABORATORIES, INC.

Call the Ansul Man!

Get in touch with your local Ansul man through the "yellow pages" or write ANSUL CHEMICAL COMPANY, Fire Equipment Division, Dept. F-124, Marinette, Wisconsin. *Write Ansul for your copy of new Fire Equipment Catalog.*

ANSUL

When inquiring check CP 1422 opposite last page

PROTECTED
BY 2,500,000 FILTER CHANNELS PER SQ. IN.!
A Celite Filter Cake is hundreds of times finer than the finest wire mesh!
CELITE
PENICILLIN

In antibiotics: Celite® Filtration assures highest purity

Celite Filtration provides the critical purity required for antibiotics because it removes even the finest suspended solids. A Celite Filter Cake contains more than 2,500,000 filter channels per square inch of surface. The Celite method also provides high production volume because it permits fast flow rates.

Celite powders may be used with any type of conventional filter. The right balance between flow and capacity with degree of purity is easily achieved . . . first in building up a pre-coat of Celite on the filter medium, then by adding small amounts to the solution to form a continuously fresh filter surface. To meet different requirements, Celite comes in nine standard grades of microscopically controlled particle size. Utmost product uniformity is assured.

Because of its simplicity, flexibility and efficiency, Celite Filtration has become the standard for entire industries. For highest purity in antibiotics, for perfect clarity in food products, for removing impurities from chemicals, petroleum, and other products . . . Celite offers unequalled advantages.

Whatever filtration problem you face, it will pay you to investigate the Celite Filtration method now. A Johns-Manville Celite Filtration Engineer will gladly discuss your problem. For his services, without obligation, write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay St., Toronto 1, Ontario.

JM PRODUCTS **Johns-Manville CELITE FILTER AIDS**

When inquiring check CP 1423 opposite last page

Hazards of common liquid extinguishers outlined

Pamphlet of eight pages covers hazards of common vaporizing liquid extinguishing agents. Publication gives an evaluation of the practical toxicity problems associated with the use of common vaporizing liquids in hand fire extinguishers.

Pamphlet 182-M is available by remitting 25c to National Fire Protection Assn., Dept. CP, 60 Batterymarch St., Boston 10, Mass.

Extinguishing agent described in 36-page booklet

Booklet of 36 pages describes development of Foamite Airfoam as a fire extinguishing agent and its application to industrial fire protection.

Detailed information on equipment necessary for combating various kinds of flammable liquid fires is included.

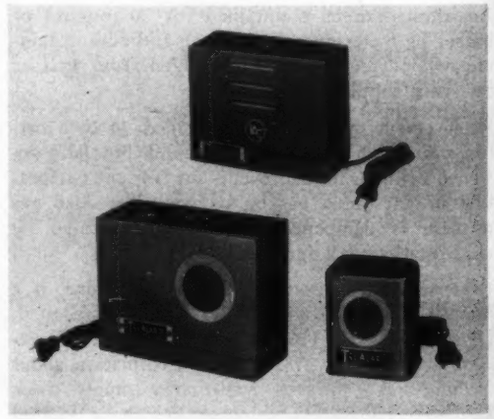
Booklet "Foamite Airfoam" is issued by American LaFrance Corp., Dept. CP, 903 Erie St., Elmira, inquiring about manufacturer's product reader may specify CP 1424 on handy form opposite last page.

Provides warning signal in case of fire . . .

may be augmented for use in detection of burglars

Combination fire and burglar alarms have been developed in three unitized models. One type employs self-policing closed circuitry for maximum protection in event of fire or to signal any break in wiring.

Another series offers fully self-contained battery supply system of the circuit closure type — operates



Combination fire and burglar alarms

Flammables

STORE SAFE and POUR SAFE

with this Approved Double-Duty Safety Container!

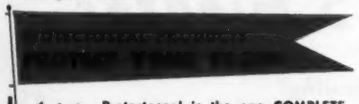
PROTECTOSEAL

STOR-POR

Dispenser

combines the functions of a Safety Can with those of a Supply Can to perform both services with one piece of equipment—eliminates cost of an extra can—does away with necessity of using a funnel with its lack of control and possibility of dangerous spillage.

The Protectoseal Stor-Por Dispenser is Underwriters Laboratories and Factory Mutual Laboratories approved. Both fill opening and pouring spout have double perforated metal fire baffles to prevent ignition of contents. Easy-working valve at base of flexible spout is operated by carrying hand and gives positive control while pouring. Available with ¼" and ⅜" flexible hoses in 1- and 2-gallon sizes, and ½", ⅝" and 1" flexible hoses or rigid spouts in 3- and 5-gallon sizes.



Protectoseal is the one COMPLETE source of approved equipment for all flammable operations—Production—Storage—Dispensing.

All Protectoseal Fire Preventive Equipment is designed by specialized engineers for time-saving and convenient use, and in most cases actually speeds production.

Send for NEW Flammables Equipment Guide Chart. Illustrates and describes 30 approved Fire Protective Safety Devices and their uses.

Fill in coupon and attach to company letterhead. West Coast Warehouse: Los Angeles, Calif. In Canada: Safety Supply Co.—Toronto.

THE PROTECTOSEAL COMPANY
1932 S. Western Ave., Chicago 8, Ill.

Without cost or obligation, send "A Guide to Selection and Use of Protectoseal Equipment for the Safe Storage, Handling and Use of Flammables."

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

When inquiring check CP 1425 opposite last page

independently of any regular current supply.

Third series is designed in individual stations for placement at any desired location and plugs into the nearest convenient outlet.

All of the fire alarm circuits may be readily augmented for use as burglar alarms. All units employ a master audible alarm signal station, actuated from any number of thermostatic fire sensing detector units.

(Alarms are a product of Industrial Automation Corp., Dept. CP, 2415 W. Montrose Ave., Chicago, Ill. . . . or for more information about manufacturer's product reader may simply check CP 1426 opposite last page.)

Roadwork for Editors

Ever wonder why industrial editors "hit the road" so many days of the year? What determines where they go and who they see?

Plant openings, trade shows, society meetings are important. Many new developments first are introduced on such occasions. But the top-notch editor doesn't attend just these

events. He's *constantly* in touch with men in the field who are on top of these developments, waiting for the news to "break". CHEMICAL PROCESSING's editors spend much of their road time in plants, getting "New Solutions" stories . . . how a plant did something better.

Many of these "case history" stories started out with an article about a new product in our columns . . . a product of unusually high interest to our readers, as judged by their letters and checks on the Reader Service slip.

The follow-up story — of how the product *performs* in service — is the result of some editor's patient persistence until he gets permission to visit the plant.

It means more roadwork for the CP editor, but it means informative reading for the processing man.

IT FIGURES...

Coveralls courtesy of Worklon Inc.

YOU WANT MAXIMUM RESISTANCE TO CHEMICALS, WEAR AND LAUNDERING IN WORK CLOTHES

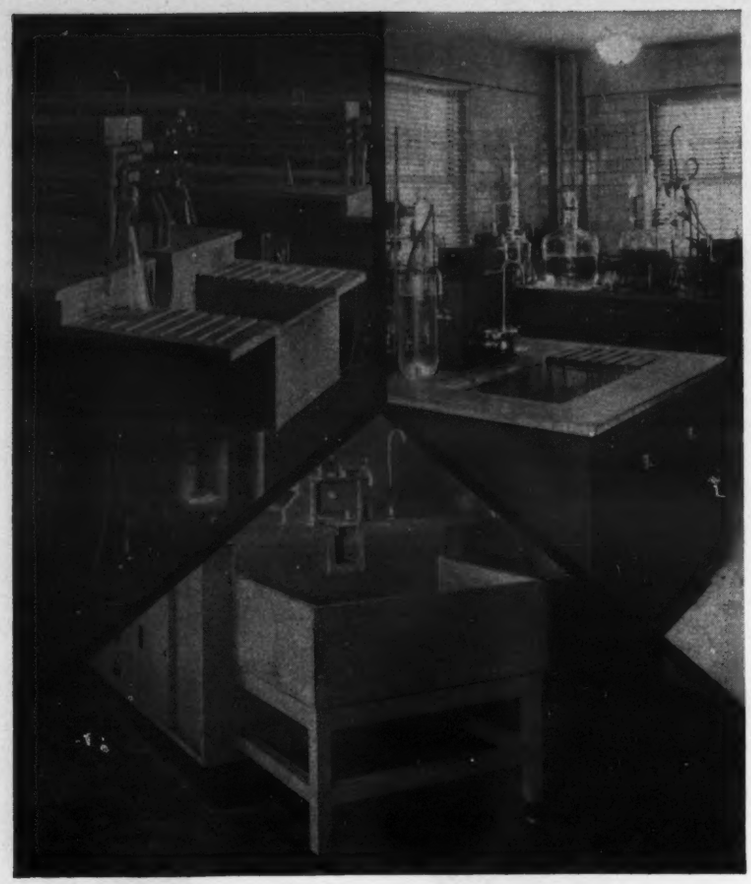
GET IT FOR LESS WITH DYNEL

THE FIBER THAT FIGURES IN YOUR FUTURE

Tests prove that shirts, pants, coveralls and lab aprons made of 100% DYNEL fiber last four or five times longer than comparable garments made with traditional fibers. DYNEL is unaffected by most chemicals; can be cleaned or decontaminated in acids – without harm; will not support combustion. It is washable, retains strength wet or dry, dries quickly. **YES, IT FIGURES.** You save because you get more for your money in 100% DYNEL work clothing. It's so long wearing that many laundries specify it for industrial rental clothing. To find out how much DYNEL can save in your operation, write us today. Dept. C.

Textile Fibers Department, Carbide and Carbon Chemicals Company,
A Division of Union Carbide and Carbon Corporation
UCC 30 East 42nd Street, New York 17, N. Y.

When inquiring check CP 1427 opposite last page



Let's talk "SPECIAL SIZES"

The size and depth of sinks for laboratory and industrial use should be determined by the job they have to do — *and not by available standard sizes!*

With Alberene Stone sinks you can specify any size and depth — without paying a premium.

And with Alberene Stone you get — *the natural silicate stone with the surface that goes all the way thru.* Its all-silicate mineral components resist chemical attack. Low absorbency makes it essentially nonstaining. Discolorations can be removed by scouring or honing without harm to the surface.

For information and technical assistance, address: Alberene Stone Corporation, 419 Fourth Avenue, New York 16, N. Y.

ALBERENE STONE

provides LOW ABSORBENCY protection

When inquiring check CP 1428 opposite last page

George Robertson, lab technician, Curtiss Candy Co., checks moisture content of candy

cuts moisture analysis time from 12 hours to 5 minutes

Eliminates weighing, measuring, and drying of samples

Problem: Curtiss Candy Co., Chicago, Ill., until about 2 months ago used conventional vacuum oven method to determine moisture content of such products as caramels, marshmallows, fudge center and cocoanut cream center. It required 10 to 12 hours to complete each test. Accurate weighing of sticky products as caramel was a tedious, time consuming task.

Solution: Instrument selected was the Universal Electroprobe which is based on the modified conductivity principle and measures moisture content in seconds rather than hours. Time elapsed from start of test until ready for next sample is about five minutes. Actual results are obtained in a matter of seconds, with the rest of the five minutes being devoted to cleaning the probe and preparing for the next sample. Electrodes clean easily, are interchangeable and separable from the instrument. Unit can be line or battery operated. Individual probes are designed for a specific product. When testing caramel and cocoanut cream, operator takes temperature reading by placing thermometer into product. Temperature correction is then attained by a turn of an instrument dial.

When testing other products, one of the probes acts as a thermometer, giving an

instantaneous temperature reading at the time of test Unit gives direct moisture percentage reading on dial located on instrument front (see photo). Manufacturer calibrates instrument to meet electrical-moisture characteristics of product being tested. This calibration is accomplished by varying number of probes, distance between them, and routing of circuit. Each calibration includes metal engraved scale (outside ring on dial).

Results: Using this moisture tester, testing time has been reduced from 10 to 12 hours to 5 minutes. Method does not require weighing, measuring, or drying of sample. Temperature correction is easily achieved by a turn of a dial. Results of tests agree with oven-type moisture determinations with a variation of less than 0.2%.

(Universal Electròprobe Moisture Tester is development of the Moore-Milford Corp., Dept. CP, 1316 Sherman Ave., Evanston, Ill. . . . or for more information about manufacturer's product reader may simply check CP 1429 on handy form opposite last page.)

Describes strand-burning to test propellants

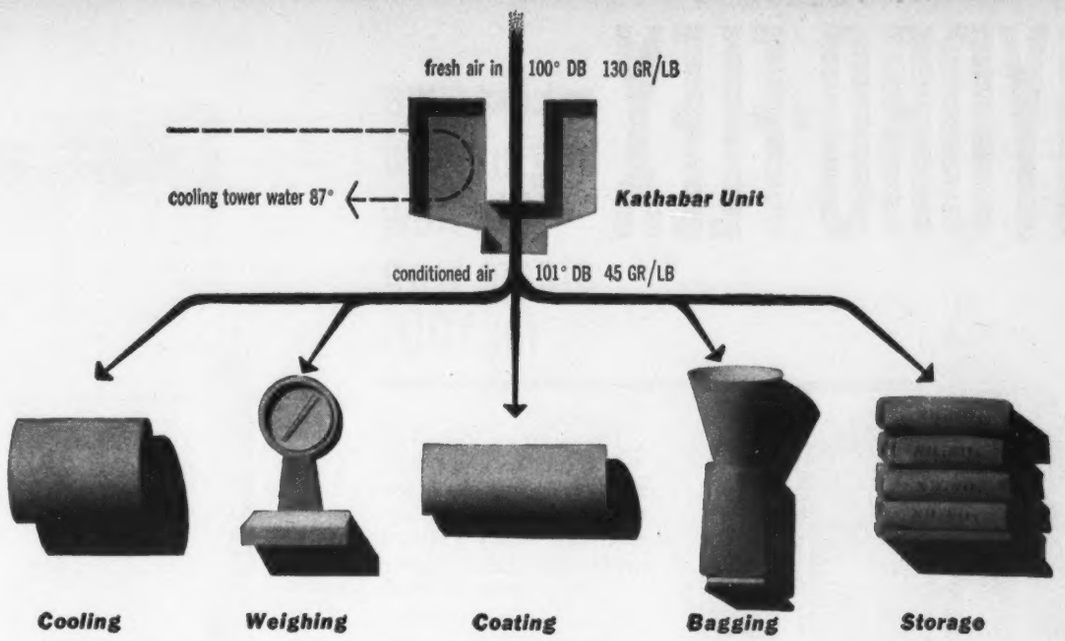
Describing complete strand-burning assembly for rapid and reproduceable measurement of solid propellant burning rate, two-page bulletin includes descriptions of components. Apparatus is designed to operate with small propellant samples, approximately 1/8" square and about six inches long. Safety features are listed. Instrument specifications are given.

Burning-rate apparatus is issued by Atlantic Research Corp., Dept. CP, 901 N. Columbus St., Alexandria, Va. When inquiring specify CP 1430 on handy form which is located opposite last page.

Details pressure bombs for testing LPG

Two-page data sheet describes uses and applications of Reid vapor pressure bombs, designed for testing non-viscous petroleum products including LPG. Both immersion and pressure models are illustrated. Bombs were especially designed for ASTM Methods D-323, D-1267.

DS No. 11526 is issued by Precision Scientific Co. Dept. CP, 3737 W. Cortland St., Chicago 47, Ill. When inquiring reader may simply specify CP 1431 on handy form which is located opposite last page.



HOW KATHABAR HUMIDITY CONDITIONING STOPS MOISTURE REGAIN IN AMMONIUM NITRATE

using 87°F coolant to get 46°F dewpoint

You can prevent moisture regain in the production of hygroscopic materials—common problem in chemical industries—by taking a cue from major producers of ammonium nitrate. They use Kathabar humidity conditioning to bathe process areas with a protective atmosphere of dry air in equilibrium with their dried prills.

Before they applied Kathabar equipment to this problem, costly recycling was often necessary to restore proper dryness and avoid clogged conveyors and bagging machines, bricking up in storage, inaccurate bagging.

Ammonium nitrate producers selected Kathabar systems to solve these problems because of several operational advantages. Kathabar units are *economical;* can deliver air at 46°F dewpoint with 87°F cooling tower water. No expensive over-cooling and reheating. They're *rugged:* perform effectively with only routine maintenance in the extremely corrosive ammonium nitrate atmospheres. They're *safe:* absorbent solution is non-inflammable, will not carry over.

Kathabar units are doing similar jobs in many other chemical process industries such as pharmaceuticals, plastics, food, rubber, film, atomic energy. They can meet your exacting requirements, too—economically, effectively, safely. Call your Kathabar system engineer or write for Literature Group K54-3 to learn how this equipment can earn for you.

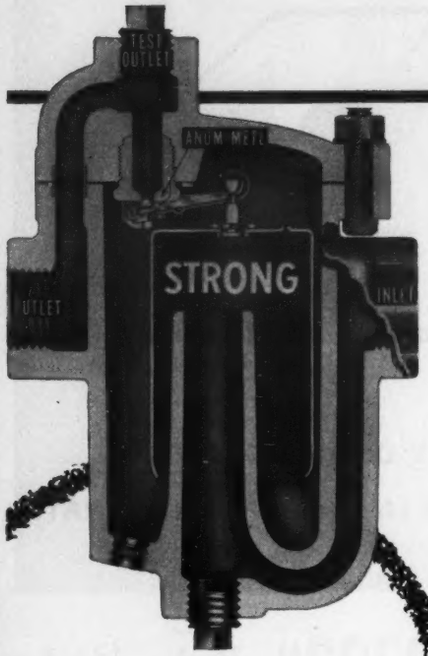
Kathabar® HUMIDITY CONDITIONING

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

ALSO MAKERS OF Surface INDUSTRIAL FURNACES Janitrol AUTOMATIC SPACE HEATING

When inquiring check CP 1432 opposite last page

HYDRO-FLEX ■■■ we engineered this new steam trap for YOU!



☐ Install Strong Hydro-Flex steam traps with assured confidence. This completely new line of low, medium, and high pressure steam traps will operate equally well on light and heavy condensate loads.

Hydro-Flex offers these outstanding features and more:

- greater discharge capacity and efficient operation under *all* conditions
- dual fulcrum arrangement that snaps the leak-free valve wide open to give unrestricted condensate flow
- all working parts and deep-drawn bucket of durable stainless steel.
- rugged construction features assure long trouble-free service.

For complete information, contact your local Strong Distributor and write for new Bulletin No. SS-40A.

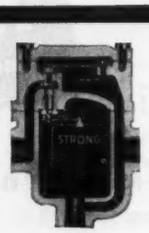
STRONG®
HYDRO-FLEX high efficiency under all condensate loads
STEAM TRAPS

STRONG, CARLISLE & HAMMOND CO.
1392 W. 3RD. STREET
CLEVELAND 13, OHIO

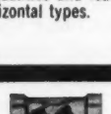
Available from over 200 industrial distributors in the United States, Canada and Foreign Countries.

BOTTOM INLET SERIES
Hydro-flex traps with bottom inlet have the same high qualities and features as horizontal types.

PRESSURE REGULATING VALVES
3 types available for wide range application . . . to meet pressure and capacity requirements.

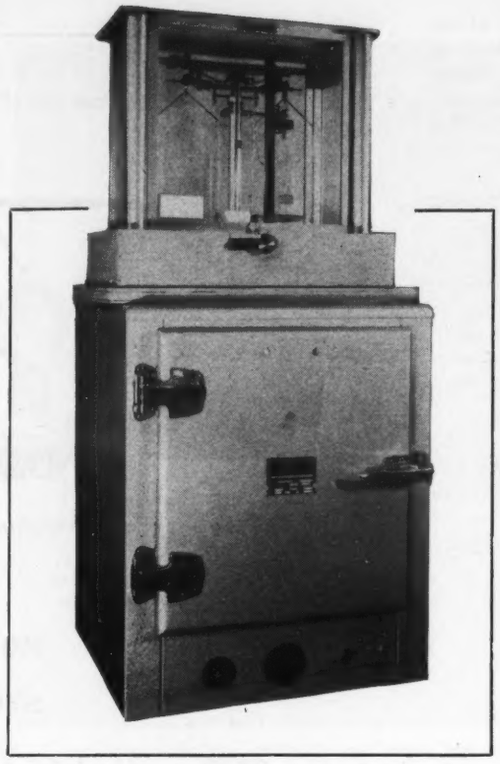


BLAST TRAPS
Thermal types for quick air and condensate removal during rapid heating up.



STRONG STRAINERS
Offer maximum protection from dirt, scale or sediment. Available in semi steel, cast steel and bronze.

When inquiring check CP 1433 opposite last page



Beat deliquescence— weigh sample in oven

Regular analytical balance is mounted on standard laboratory oven

Finicky work in drying to constant weight carries with it the guesswork of how much deliquescence or "regain" a dried sample makes while being transferred to desiccators and being weighed. Accuracy, of course, suffers in such situations. Time is lost, too, in transfers, rechecking, and sometimes wrestling with conscience as to whether further rechecks should be made.

Faced with this problem, one paper mill research lab combined an analytical balance (modified for this job) with a regular drying oven.

First step in mounting balance on the oven was to fasten a 3/8" sheet of asbestos board on top of the oven. After placing balance in position, a 3/4" hole was drilled through asbestos board and oven top so that the oven hanger was approximately three inches from the inside wall and half-way between the front and back of the oven. A light brass bushing was fastened into the hole to prevent oven insulation from coming out. Space between the oven top and

FROM RAINCAP TO HOOD

Illustrated above is part of a new PLA-TANK Duct System which is typical of dozens being installed for fume exhausts in plating rooms, maintenance shops and chemical processing plants. PLA-TANK was chosen for the entire system from hoods to raincaps on the outside stacks.

Included in the system (in addition to hoods, ducts, stacks and caps) are molded PLA-TANK fan housings and propeller-type fan blades. *Everything that contacts the fumes is molded of chemical-resistant PLA-TANK.*

PLA-TANK, molded from long-life, resin-bonded glass fibre laminate is resistant to a wide variety of fumes and temperatures. It is lightweight, easy to install, competitively priced.

PLA-TANK can be the answer to your duct system problem. Let us help you the modern way — with PLA-TANK.

First in the field — and still the leader

Send for free data sheets

PLA-TANK, INC.
DIVISION OF
The Chemical Corporation
Dept. 63 • West Warren, Massachusetts

When inquiring check CP 1434 opposite last page

balance bottom was enclosed to prevent air current from affecting the weighing.

Analytical balance is modified to have four leveling feet instead of two. A hook is placed on the underside of the left pan and is called an oven hook. It is a telescoping brass rod 6 to 12" long with length determined by a thumb-screw. Left pan arrest is large ring style. Sensitivity of balance is one mg; capacity is 200 gm on each pan.

(Modified balance is product of Arthur S. La Pine & Company, Dept. CP, 6001 S. Knox Ave., Chicago 29, Ill. . . . or for more information check CP 1435 on handy form opposite last page.)

Molecular filter separates at rate of 250 ml water/hr . . .

uses ordinary pressure filtration methods to separate large, small molecules

Uses: Laboratory separation of large and small molecules at rate of 250 ml of water/hr.

Features: Filter allows continuous or batch operation and requires no more technique than is used in ordinary pressure filtration.

Description: Filter consists of stainless steel reservoir and filter unit. Solution to be filtered is introduced to 1750-ml reservoir and pressure of 100 psi. Solution is fed to filter contained in Pyrex-brand glass cell. Filtrate passes through walls of cartridge and collects in the bottom of the cell with residue removed from the outlet end of cartridge. Cartridge is replaceable. Filter membrane contains pores of approximately 5 mμ in size and is approximately 0.0015" thick. Membrane is protected by cotton braided tube so liquid can be forced through under pressures of 100 psig.

Molecular filter allows either batch or continuous operation

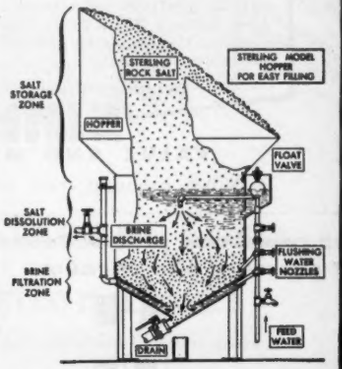
All fittings are hand-connected. Special tools are not required. Either a 125- or 250-ml replaceable cartridge can be supplied.

(Molecular filter is product of The Emil Greiner Co., Dept. CP, 20-26 North Moore St., New York 13, New York . . . or for more information about the manufacturer's product, reader may simply check CP 1436 on the convenient Reader Service slip which is located opposite last page.)

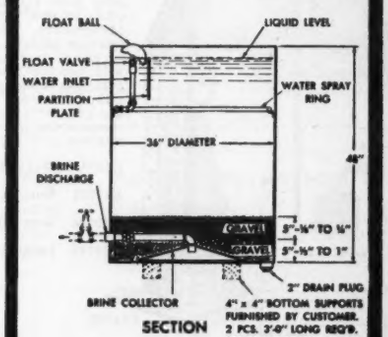
BRINE HEADQUARTERS

The great mines . . . the refineries . . . the years of teamwork with all brine-using industries . . . enable International to provide the equipment, methods and know-how to make better brine at lower cost with greater efficiency . . . in any plant . . . for any industry.

THE STERLING MODEL
LIXATE ROCK SALT DISSOLVER



THE STERLING
EVAPORATED SALT DISSOLVER



From Sterling Rock Salt or Evaporated Salt

BRINE, AUTOMATICALLY MADE
. . . ALWAYS SATURATED
. . . PIPED TO ALL POINTS OF USE

For consultation without obligation, with a qualified International Industrial Engineer, write . . .

INTERNATIONAL SALT COMPANY, INC.
INDUSTRIAL DIVISION • SCRANTON 2, PA.

SALES OFFICES: Atlanta, Ga. • Chicago, Ill. • New Orleans, La. • Baltimore, Md. Boston, Mass. • Detroit, Mich. • St. Louis, Mo. • Newark, N. J. • Buffalo, N. Y. • New York, N. Y. Cincinnati, O. • Cleveland, O. • Philadelphia, Pa. • Pittsburgh, Pa. • Richmond, Va.
ENGINEERING OFFICES: Atlanta, Ga. • Chicago, Ill. • Buffalo, N. Y.

When inquiring check CP 1437 opposite last page

Self-scouring!

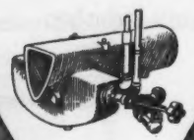
SIMPLEX PARABOLIC FLUME

Measures open flows within ± 2%

...over full 20 to 1 range!

PLANT WASTES • ALKALIES

ACIDS • WATER • SLUDGE



Type S Flume is used alone to indicate flow . . . with meter to record, totalize.

Easy to Install! No special approach piping needed. Inlets fit 6" to 36" pipe. Levelling pins simplify field setting.

Smooth transition from circular inlet to parabolic outlet speeds flow, keeping flume clear. Big chamber traps sediment, keeps piezometer hole clean.

WRITE FOR BULLETIN 800

Simplex Valve & Meter Company
Dept. CP-10
7 East Orange St., Lancaster, Pa.

Accurate instruments and controls since 1904

SIMPLEX

VALVE AND METER COMPANY

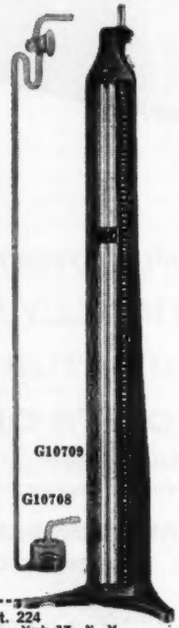
When inquiring check CP 1438 opposite last page

for rapid and precise measurement of pressure and vacuum

ABSOLUTE AND DIFFERENTIAL

Manometers

for industry • pilot plant and laboratory



To cover the full range of pressure and vacuum measurements in the laboratory, pilot plant and industry, Emil Greiner offers its new Absolute and Differential Manometers. With these Manometers you can achieve either absolute or differential manometric measurements with unprecedented simplicity and high precision. Only a single reading is required to obtain a precise measurement automatically corrected for ambient temperature and reduced to a height of mercury at 0° C.

G10705A	Range: 0-200 mm. (Glass only)	ea. 29.50
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G10705A

G10705

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For More Complete Information Write For "Constant Pressure and Vacuum Control Manual"

The **EMIL GREINER Co.**

26-26 N. MOORE STREET DEPT. 224 N. Y. 13, N. Y.

The Emil Greiner Co., Dept. 224
20-26 N. Moore Street, New York 13, N. Y.
Please send me Instant Pressure & Vacuum Control Manual.

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When inquiring check CP 1439 opposite last page

LABORATORY

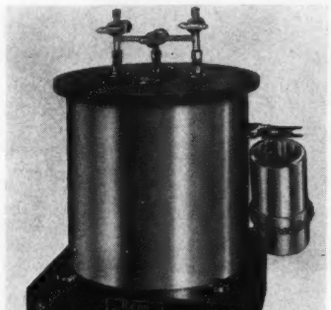
Uses helium gas stream to separate compounds in packed column . . .

micro-distillation unit separates components in minutes

Uses: Rapid qualitative and quantitative analysis of volatile compounds, using samples of 2 to 200 mg.

Features: Instrument separates components by micro-distillation column within minutes and charts information on automatic recorder.

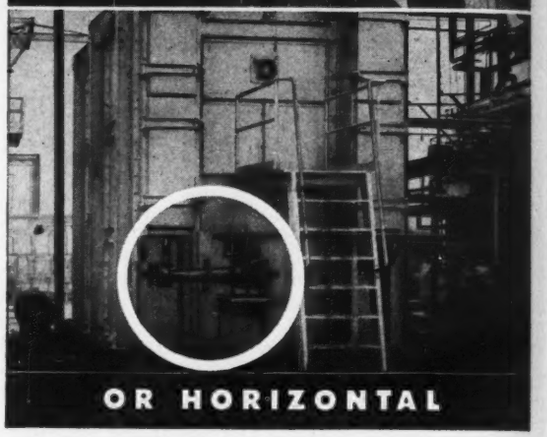
Description: Volatile materials are separated by a helium gas stream flowing through specially packed column of celite wet with high boiling-point oil. As each separated component leaves column, material passes through highly sensitive thermal-conductivity cell which relays voltage differences to electronic strip-chart recorder. Data are presented as a plot of thermal conductivity versus time. Each component in the mixture is represented by a peak in the curve. Amount and boiling point of each compound may be closely approximated by size and position of each peak.



Qualitatively and quantitatively analyzes samples from 2-200 mg

Unit handles volatile samples boiling as low as 20°C and up to 350°C.

(Distillograph is product of Research Equipment Corp., Dept. CP, 1135 Third St., Oakland, Calif. . . . or for more information check CP 1440 on handy form opposite last page.)



many more hours on stream without forced shutdown with NATIONAL AIROIL

OIL-GAS TANDEM COMBUSTION UNITS

Exclusively for vertical firing, the new National Airoil VERTICAL Tandem Block Units retain all the features of our regular horizontal Tandem Units . . . *plus:* special, pre-cast refractory shapes for easier, cost-saving vertical installation and maintenance; secondary air inlet louvres for positive control of vertical flame pattern; and, all steel duplex detaching gear which enables swift, simple vertical burner changeover.

VERTICAL and HORIZONTAL Tandem Units hold air in the combustion zone until fuel and heated air are thoroughly mixed. This means that ignition takes place in a hot zone; the result: high fuel economy through more rapid combustion with a minimum of excess air. NATIONAL AIROIL's patented Tandem Combustion Units allow secondary air to be easily and accurately controlled. By adjusting air control louvres, flame can be shaped to radiate heat uniformly without tube impingement.

The VERTICAL or HORIZONTAL Tandem Unit is always fired with NATIONAL AIROIL Combination Oil and Gas Burners . . . has a high turndown ratio with a steady flame temperature using either fuel oil or gas. With the TANDEM UNIT'S clean flame, a cold furnace can be brought to full capacity in a short time.

"Many, many more hours on stream, without shutdown" . . . yes, YOU will realize higher profits from YOUR heaters when NATIONAL AIROIL VERTICAL or HORIZONTAL Tandem Units are specified. Our new Bulletin 498 is yours for the asking.

NATIONAL AIROIL BURNER CO., INC.

CHEMICAL-PETROLEUM DIVISION

1300 EAST SEDGLEY AVE., PHILADELPHIA 34, PA.

Southwestern Division: 2512 South Boulevard, Houston 6, Texas

INDUSTRIAL OIL BURNERS, GAS BURNERS, FURNACE EQUIPMENT

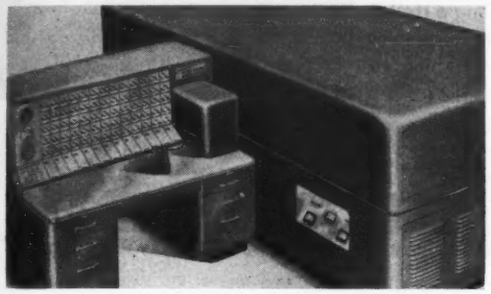
When inquiring check CP 1441 opposite last page

Has folded-over optical system with four working spectra instead of two . . .

optical compartment of spectrograph is air-conditioned to eliminate air-conditioning lab

Spectrograph uses four working spectra instead of two. Folded-over optical system reduces space usually required. Instrument is multi-matrix double-spectrum all-electronic unit.

Emission source is entirely electronic and auxiliary spark gaps are not required. Source parameters are selected automatically to match each matrix being analyzed. Optical system gives two complete spectra,



each covering both first and second orders. Pickups can be set on any spectral line. All pick-up units are interchangeable as are the plug-in AC amplifier units. Electronic integration system converts intensities of spectrum lines into proportional "counts".

Optical compartment has built-in temperature control and eliminates need for air-conditioning laboratory. Instrument has 65 independent channels.

(Spectro Analyzer is product of Fisher Scientific Company, Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information check CP 1442 on handy form opposite last page.)

"And remember, put a little drama into that sales pitch"

New Sarco Thermodynamic Steam Trap practically eliminates maintenance!

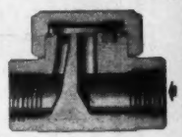
Only moving part—a hardened Solid Stainless Steel Disc—practically wear-proof!

SOME OF MANY ADVANTAGES

1. Same trap for all loads and pressures 10-600 psi.
2. Closes tight on no load.
3. Operates against back pressures up to 50% of inlet pressure.
4. Not affected by superheat, water-hammer, vibration, corrosive condensate.
5. Smallest inventory of spare parts.

SIMPLICITY—to the Nth degree!

No valve-closing mechanisms to wear or stick. No critical clearances to choke. No gaskets to leak. Three simple parts...machined from stainless steel bar stock. Only one moving part. What could be simpler?



SARCO COMPANY, INC.

2133-B

Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.

Please send me: ☐ Bulletin 255-44
☐ A Sarco Thermodynamic Steam Trap for 60-day trial. Size_____ for installation on_____

NAME_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

When inquiring check CP 1443 opposite last page

The **VALDURA** name stands for a complete line of specialized industrial maintenance products designed to serve every type of American industry. Typical products are indicated below. Other Valdura Specifics and Exclusives will be identified in future ads. Watch for them! They can solve your toughest maintenance problems.

M & F HEAVY DUTY Enamel, available in 22 brilliant, non-fading industrial colors, is a maintenance favorite for both interior and exterior use. Its superior washability and resistance to abrasion make it perfect for many jobs . . . floors, walls, woodwork, machinery, etc., etc., etc.

Industrial users who carefully figure maintenance costs on a "per square foot per year" basis insist upon M & F.

▼

PRO-SHEEN is a painter's type latex with one coat capabilities not found in ordinary latex paints.

▶ READY TO USE ▶ ODORLESS

IN WHITE AND FAVORED INDUSTRIAL COLORS

If you have a particular maintenance problem which is urgent just describe it on your regular letterhead and mail to the address below. Your inquiry will be treated as an invitation to provide service . . . not as a license to exert selling pressure!

VALDURA
HEAVY DUTY
PAINT DIVISION
AMERICAN-MARIETTA CO.
101 E. Ontario St., Chicago 11, Ill.

When inquiring check CP 1444 opposite last page

FOR THE LABORATORY

Discusses water bath precise to 0.001°C

Four-page bulletin discusses precision, constant-temperature water baths which maintain temperature within plus or minus 0.001°C over operating range of 0°C to 65°C. Precision is obtained by application of radiant heat through bottom of container.

Universal Infra-Red Bath is issued by Chicago Apparatus Co., Dept. CP, 1735 N. Ashland Ave., Chicago 22, Ill. When inquiring specify CP 1445 on handy form opposite last page.

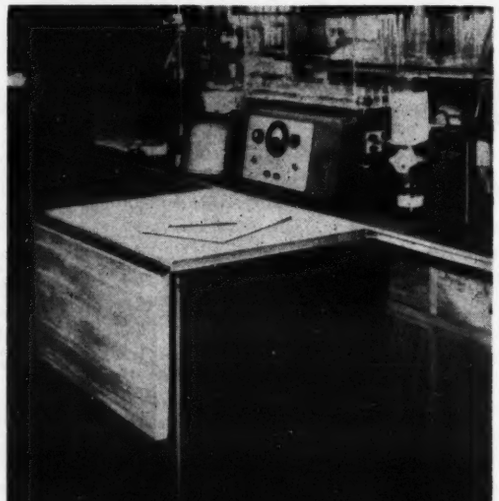
Mobile bench gives 5 sq ft of extra space for lab . . .

slides along rail screwed to bench or table, is easily locked in place

Uses: For providing extra bench space in a laboratory.

Features: Bench slides along rails attached to permanent bench. Two small ball-end levers lock retaining pin-heads into rail.

Description: Mobile bench has solid teak top and tubular steel legs. It provides 5 sq ft of bench space with flap up (3 sq ft with flap down). Leg



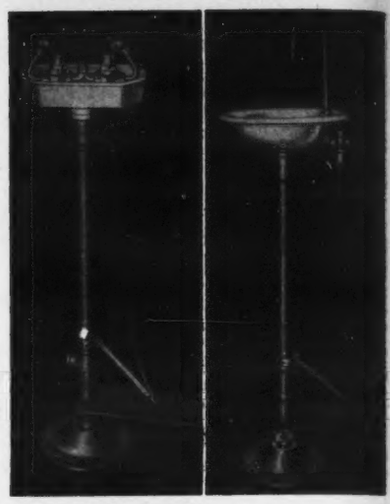
Bench slides along rails

TAKE EVERY PRECAUTION . . .

TO SAVE PRICELESS VISION!

The HAWS Eye-Wash Fountain makes it possible for the worker himself to safely, easily wash injurious chemicals and foreign matter from the eyes before medical aid can be at hand. Has the potentiality of saving vision, reducing insurance claims.

AND to *prevent* dangerous and expensive eye accidents, encourage workers to wear goggles and plastic face shields by installing a HAWS Goggle-Wash Fountain—eliminates one of workers' main objections to wearing these safety devices.



"Precaution" is really the cheapest thing you can buy!
HAWS Safety Equipment costs only a few cents per worker.
Write for literature today!

HAWS DRINKING FAUCET CO.
1443 FOURTH STREET (Since 1909) BERKELEY 10, CALIFORNIA

When inquiring check CP 1446 opposite last page

Without Adjustments
Peak Performance
Faster Warm Up
Universal Pressure
Reduced Wear
Low Inventory
0 to 250 lbs.
Just Order by Pipe Size (½" thru 2")
GREATER CAPACITY
Write for Bulletin 800C

"WHERE *Good Connections* COUNT"
PERFECTING SERVICE COMPANY
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When inquiring check CP 1447 opposite last page

height is adjustable and locked in place by toggle screws.

Mobile bench is moved along slide rail to desired position, locked in place by shooting bolt under the permanent bench and tightening lock-screw. It comes with nine ft of guide rail. Leg height is adjustable from 28 to 38" bench height.

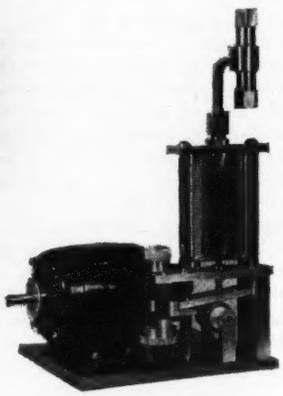
(Rolla-Bench is product of Palo Laboratories, Inc., Dept. CP, 81 Reade St., New York 7, N.Y. . . . or for more information check CP 1448 on handy form opposite last page.)

Pumps liquids, melted solids without any possibility of contamination

Uses: Lab-scale pumping of materials normally liquid at room temperature. Adaptable for pumping low-boiling liquids as pentane, melted solids, and viscous materials.

Features: Parts are machined to fit together without packing, gasket material or pipe compounds. Pump will not contaminate material handled.

Description: Unit consists of ball check valve assembly and bellows, both of stainless steel, motor-speed reducer, and eccentric needle bearing. Parts are assembled on chrome-plated base and frame. Motor housing is sheet steel coated with baked enamel and has ventilation ports for cool operation. Micrometer adjustment is built into pump for changing pumping rate. Pump operates by compression and expansion of bellows, driven by motor eccentric.



Eccentric compresses and expands stainless steel bellows for contamination-free pumping

Capacity is 15 to 1000 ml/hr. Another model has pumping rate of 30 to 2000 ml/hr. Motor is 110v AC, 60 cps. Pump is designed for operation at 15- to 30-psi gage. Outlet and inlet connections are threaded to receive ⅛" pipe fittings. Unit weighs approximately 5½ lb, is 6 x 3½ x 10⅜". Other models are available in Monel, brass or Teflon.

(Micro-bellows pump is product of Research Appliance Company, Dept. CP, Box 463, West View Road, Pittsburgh 9, Pa. . . . or for more information check CP 1449 on handy form opposite last page.)

Wagner®
ELECTRIC MOTORS
. . . the choice of leaders in industry

New NEMA Frames
Standard and Explosion-proof

Type EP
215 Frame

Wagner Totally-Enclosed Fan-Cooled Motors

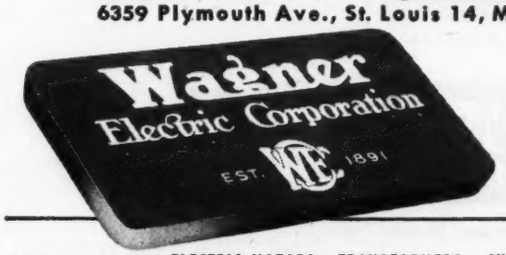
cut maintenance time and costs

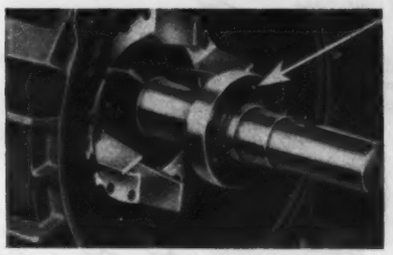
Check the features of the new *Wagner Type EP Totally Enclosed Motor*. They spell the difference between needless expenditures in maintenance time and costs . . . and a definite savings in motor upkeep and repairs. You'll find that for general industrial use where dust, dirt, filings, abrasives, steel chips or moisture are present, the Wagner Type EP Motor gives steady, troublefree performance and longer service life.

Wagner Type JP Explosion-Proof Motor . . . has the same quality construction as the Type EP — plus added features which make it completely safe to operate where explosive dust, gases or vapors are present.

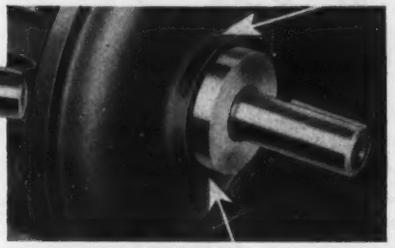
Both Type EP and JP Wagner motors are available in ratings up to 250 horsepower. For complete information, just call the nearest of our 32 branch offices, or write for Bulletin MU-203.

Wagner Electric Corporation
6359 Plymouth Ave., St. Louis 14, Mo.



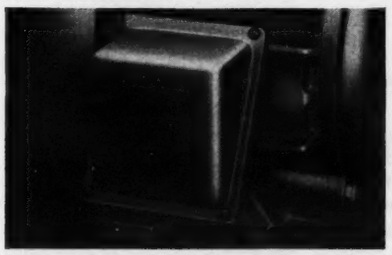


1 HEAVY-DUTY BALL BEARINGS—Highest quality bearings of more than ample capacity provide long, troublefree service.



2 BEARINGS CAN BE RE-LUBRICATED—Wagner motors can be re-lubricated when necessary to prolong bearing life.

3 BEARINGS STAY CLEAN—Both ends of these motors are equipped with running shaft seals, a machined collar mounted on the motor shaft.



4 EASY TO CONNECT—Large diagonally-split conduit box provides ample room for making connections. Leads are permanently identified.

5 NO GREASE LOSS—Bearing housings have effective seals to prevent escape of grease.

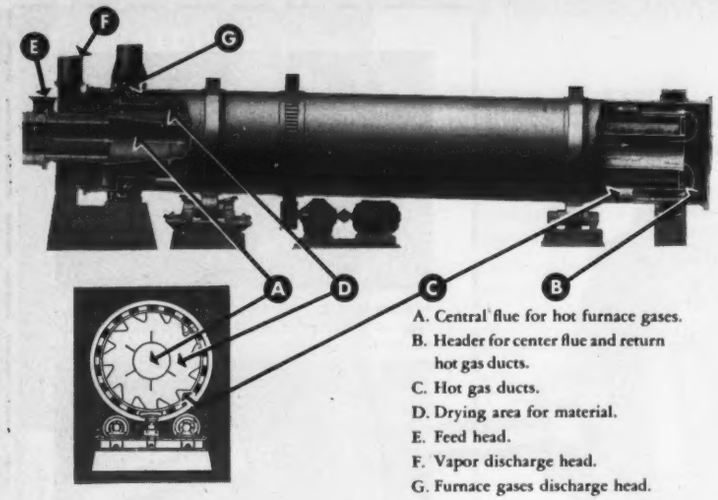
6 RIBBED FRAME—Ribs on the corrosion-resistant cast iron frames add mechanical strength and increase the surface area for more efficient cooling.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

M55-18

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

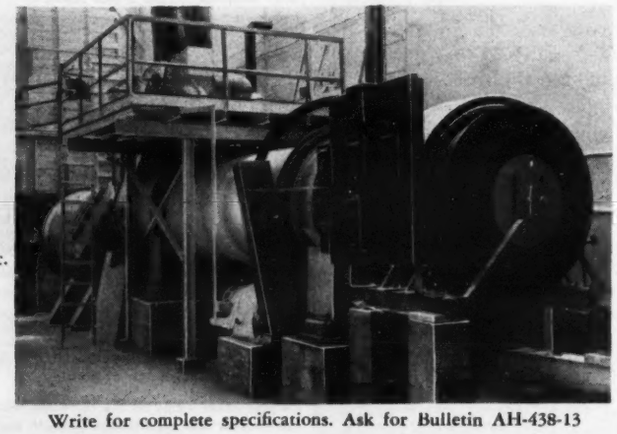
When inquiring check CP 1450 opposite last page



A. Central flue for hot furnace gases.
B. Header for center flue and return hot gas ducts.
C. Hot gas ducts.
D. Drying area for material.
E. Feed head.
F. Vapor discharge head.
G. Furnace gases discharge head.

Ruggles-Coles INDIRECT-FIRED DRYERS and HEATERS

- Dry without contamination from combustion gases, regardless of fuel.
- Minimize auxiliary dust collection when handling fine precipitates and filter cake.
- Heat pulverized materials for process work.
- Collect vapors at high concentration.
- Available fabricated with heat and corrosion-resistant metals.



Ruggles-Coles Indirect Heat Dryer handling 200 mesh talc.

Write for complete specifications. Ask for Bulletin AH-438-13

HARDINGE
COMPANY, INCORPORATED

YORK, PENNSYLVANIA • 240 Arch St. • Main Office and Works
New York • Toronto • Chicago • Hibbing • Houston • Salt Lake City • San Francisco

When inquiring check CP 1451 opposite last page

FOR THE LABORATORY

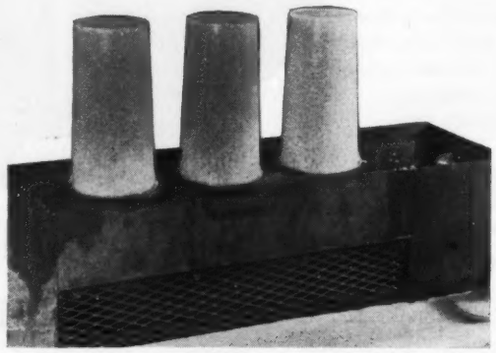
Ultrasonic emulsifier uses focused barium titanate transducer bowls . . .

particle size is reduced to vicinity of one to five microns by cavitation

Uses: For emulsifying oils in water, on either batch or continuous flow basis, without stabilizers.

Features: Unit reduces particle size to vicinity of one to five microns by cavitation forces of focused ultrasonic waves.

Description: Focused barium titanate bowls are used for either batch or continuous flow processing Bowls are rated at 250 watts power input at



Three barium titanate bowls focus ultrasonic waves

frequency of one mc. As many bowls as necessary may be combined in parallel for high volume output. Three-bowl model includes recirculating system, settling and flow rate control.

Unit is capable of producing a 90% emulsion of 7% oleic acid in water by volume. Particle size of oleic acid is from 5 to ½ μ, averaging 1 μ. Stability without stabilizers is greater than three months. Rate of emulsification is two lb/hr oleic acid.

(Ultrasonic emulsifier is product of McKenna Laboratories, Dept. CP, 2503 Main St., Santa Monica, Calif. . . . or for more information check CP 1452 on handy form opposite last page.)

Details electric lab ovens and furnaces

Illustrating three laboratory ovens, four-page, two-color bulletin includes details on laboratory muffle furnaces. Portable cooling unit is also described.

Bul 5520 is issued by Gardner Laboratory, Inc., Dept. CP, 4723 Elm St., Bethesda 14, Maryland. Specify CP 1453 opposite last page.

CROWN MITRE GEAR UNITS

. . . transfer power at 90° angles . . . guaranteed to give satisfactory service.

Ideal for all types of right angle problems, Crown Gear Units are compact, rugged and engineered for *industrial* use. Completely enclosed, the Crown Mitre Gear Unit has a convenient lubrication port, and provides four or five mounting flanges.

Special models will be engineered and quotations submitted for any specific problem. Crown Gear Units are available almost everywhere. — Write today for your distributor's name, or engineering details.

CROWN GEAR

a division of Harrington & Richardson, Inc.
328 PARK AVENUE, WORCESTER 10, MASS.

Over 120 leading distributors in 43 states, Crown Mitre Gear Units are *where you want them . . . when you want them.*

Sold in Canada by H. & R. Arms Co., Ltd., Montreal 23, P. Q.

When inquiring check CP 1454 opposite last page

Detects and records elements of high atomic weight in gas mixtures . . .

has monochromatic X-ray beam for accurate, well-defined absorption measurements

Uses: Instrument is designed for rapid quantitative analysis in chemical and related fields.

Features: Detects elements of high atomic weight in gas mixtures and determines amounts present.

Description: Monochromatic X-ray beam permits well-defined absorption measurements. Target of X-ray tube is copper. Geiger tube is self-quenching and has high quantum efficiency for copper K-alpha radiation. Pressure-regulating system maintains sample gas at constant pressure ±0.01 psi. Strip-chart recorder is DC Wheatstone bridge receiver with polystyrene disc-wedge absorption standard.

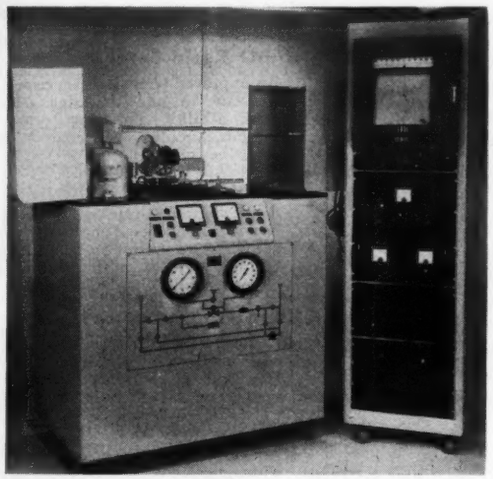


Chart continuously records elements present

Unit operates on 115v AC. Complete installation consists of two units: analysis assembly and circuit panel.

(Gas analyzer is product of Research & Control Instruments Div., North American Philips Co., Dept. CP, 750 S. Fulton Ave., Mount Vernon, N.Y. . . . or for more information check CP 1455 on handy form opposite last page.)

Handiest nomograph yet for compressibility factors for the gas law — see page 254

Fabric helps Alcoa turn "Red Mud" into magic metal—

Aluminum at its versatile best—the Alcoa building in Pittsburgh.

Increasingly efficient production methods are a prime factor in the constant growth of the aluminum industry. In this efficiency, a new Wellington Sears fabric is playing a vital role. In the process of refining aluminum from bauxite at Alcoa's Bauxite, Ark. plant (shown at left), an insoluble "red mud"—iron, silicon, and titanium—is filtered out. Some aluminum, however, still remains in the "red mud" residue. But today Alcoa's modern methods of refining this one-time waste have remarkably increased aluminum output.

The process places heavy stress on the filtering fabric. The problem of developing a filter cloth that would stand up to strong caustics and provide easier "cake" discharge was given priority at Wellington Sears. We are proud that our specially developed fabric has been approved by Alcoa for commercial use.

In this way, for over a century, Wellington Sears has tried to blueprint fabrics for industrial progress. Whatever your filtration problem—why not talk to one of the leading filtration experts who distribute our fabrics. Most likely there's a Wellington Sears cotton or synthetic fabric that will help solve it.

Write us for illustrated booklet on "Filter Fabric Facts." Address Dept. M10.

Wellington Sears

A Subsidiary of West Point Manufacturing Company

FIRST In Fabrics For Industry

Wellington Sears Company,
65 Worth Street, New York 13, N. Y.

Offices in: Atlanta • Boston • Chicago • Dallas • Detroit • Los Angeles • Philadelphia • San Francisco • St. Louis

When inquiring check CP 1456 opposite last page

THERMAL TYPE CA DIRECT FIRED AIR HEATERS

COMPACT . . . EASILY INSTALLED

Readily fitted to ovens, kilns, spray dryers, etc., the THERMAL Type CA Air Heater is an ideal source of heat where products of combustion may be mixed with the air. Oil, gas or combination firing is available without change in heater construction.

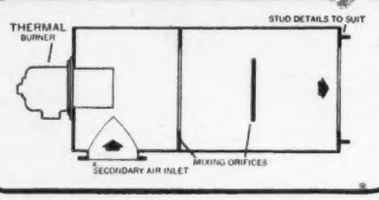
NO REFRACTORY REQUIRED . . .

The THERMAL High Velocity Burner built into the heater permits combustion to be substantially completed within the burner itself. Thus the heater is basically a mixing chamber wherein the products of combustion are mixed with the air being heated. Refractory is not normally used. Successful applications have been made ranging from under 200,000 BTU/hr. to over 20,000,000 BTU/hr. and at all pressure levels.

FOR DETAILED INFORMATION WRITE FOR BULLETIN 104

UNITIZED CONSTRUCTION

Initial cost and upkeep is kept at a minimum through the use of all welded, all metal construction. The CA Air Heaters are normally supplied as complete "package" installations.



OTHER THERMAL PRODUCTS & SERVICES → Gas, Oil & Combination Gas-Oil Burners • Heat Exchangers • Submerged Combustion • Combustion & Heat Transfer Engineering

THERMAL

Thermal Research & Engineering Corp.

CONSHOHOCKEN • PENNSYLVANIA

REPRESENTATIVES IN PRINCIPAL CITIES

When inquiring check CP 1457 opposite last page

FOR THE LABORATORY

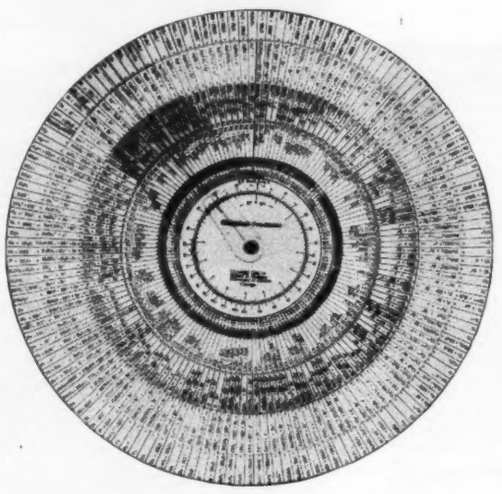
Predicts 80,000 reactions, equilibrium constants, free energy . . .

sliderule-like calculator tells whether reaction will go, aids in balancing it, too

Uses: Predicts whether or not reaction will take place, aids in balancing it. Supplementary information is provided — standard potential, equilibrium constant, free energy, changes in potential with concentration.

Features: Complete in itself, plastic calculator enables chemist to simply line up desired components and read out all the information.

Description: Made completely of plastic, predictor has four moveable scales. Two of these contain oxidation reactions and their potentials; two others complimentary reduction reactions and potentials. By aligning proper disc entries equation is shown. Further, both potentials are shown. And if net potential (sum of oxidation and reduction potentials) is positive, reaction can occur. Net negative potential shows when no reaction will take place.



Diameter of calculator is 9½ inches — close-up shows segment of calculator (not aligned) nearly actual size

When properly aligned, for example, predictor would show that permanganate will oxidize hydrogen sulfide (though it would not show proper balance for this equation). Thus —

$$H_2S + MnO_4^- + 8H^+ + 5e \rightarrow S + 2H^+ + 2e + Mn^{++} + 4H_2O \quad -0.14 + 1.51$$

ACID-PROOF CEMENTS

Many factors govern the choice of the proper cement for each installation. The Maurice A. Knight line includes a wide variety of acid-proof cements for every purpose:

PERMANITE Resin Cement

The most versatile chemically resistant cement. Satisfactory for non-oxidizing acids, alkalies, and organic solvents. Available in quick setting or slow setting type to suit the installation.

KABO Resin Cement

An improved phenolic resin cement. Resistant to non-oxidizing acids, weak alkalies, and most organic solvents. Supplied with either silica or carbon filler.

KNIGHTBOND Cement

A plasticized sulfur cement. Satisfactory for all acids and many solvents. Sets immediately upon cooling. Available with either silica or carbon filler.

KNIGHT #2 Cement

A chemically setting sodium silicate cement. Inert to all acids, except HF, and all solvents. Does not spall, grow or soften in the joints.

ACIDSIL Cement

An improved silicate type cement with greater water resistance and higher physical strength. Resistant to crystallization cracking and vitrification to 1900°F.

CORESITE Cement

A chemically setting, inorganic composition. Satisfactory for alkalies, dilute acids, and solvents. Recommended for bleach, salt water, chlorine gas, and sulfur dioxide solutions.

SUPER XX Cement

A quick setting refractory cement. Inert to all acids, except HF, and all solvents. Will not spall, vitrify, or soften at 2500°F. Excellent resistance to thermal shock and low coefficient of expansion.

For further details on acid-proof cements, write

MAURICE A. KNIGHT

410 Kelly Ave., Akron 6, Ohio

When inquiring check CP 1458 opposite last page

Net potential of +1.37 shows that reaction will take place. Proper balance is indicated, too — oxidation reaction must be multiplied by five and reduction reaction by two.

(Chemical Predictor is available through E. H. Sargent & Co., Dept. CP, 4647 W. Foster Ave., Chicago 30, Ill. . . . or for more information check CP 1459 opposite last page.)

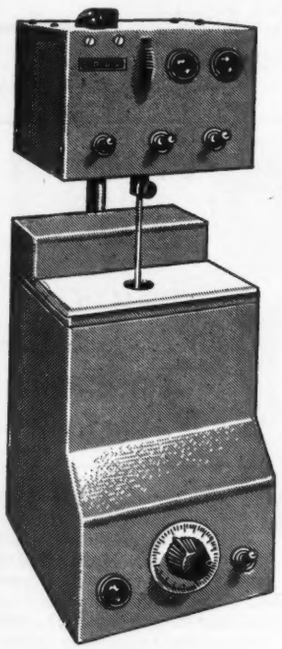
Automatically tests polyester resins for gelation time or stability to 50,000 centipoises . . .

oscillator automatically stops timer when desired viscosity is reached

Uses: Determines gelation time, stability of polyesters, phenolics in research or production.

Features: Instrument is automatic. After the unit has been set up for test, instrument runs test to completion and frees operator for other work.

Description: Oscillator which is sensitive from 5000 to 50,000 centipoises automatically stops timer when desired viscosity range is reached. Constant temperature bath ranges from ambient to 212°F. No clean-up time is required as test tubes and oscillator strip are discarded after use. Readings can be taken any time during test period. Instrument is suitable for Society of The Plastics Industry gel test for polyester resins. One model is calibrated in seconds or tenths of minutes; another is calibrated in tenths of minutes or minutes. Both models are equipped with four digit counters and operate on 115v AC. Constant temperature bath complete with controls and support rod is furnished separately.



Gelometer automatically determines stability of plastics

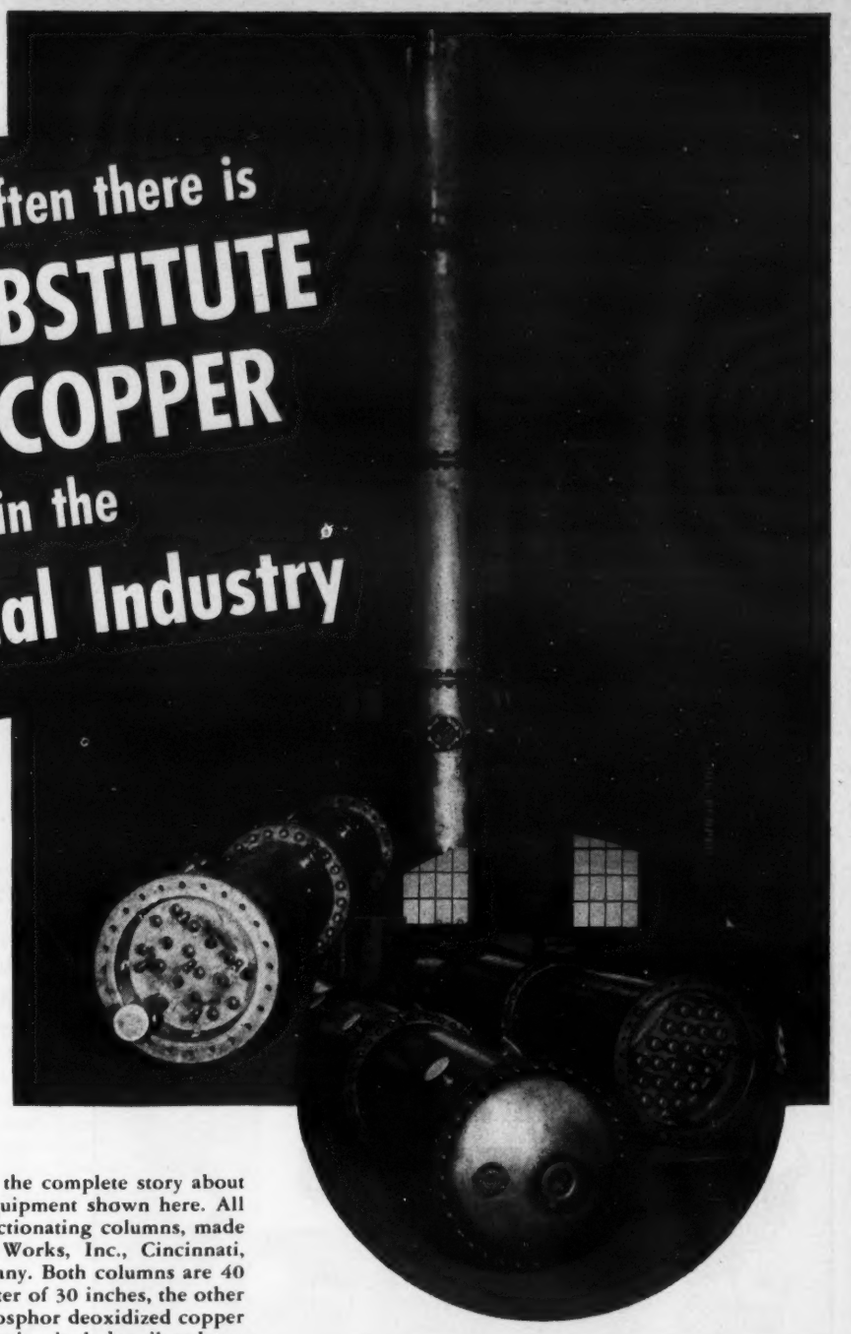
(Castor gelometer is product of Burrell Corporation, Dept. CP, 2223 Fifth Ave., Pittsburgh 19, Pa. . . . or for more information check CP 1460 on handy form which is located opposite last page.)

So very often there is

NO SUBSTITUTE FOR COPPER

in the

Chemical Industry



Fractionating columns made by Ansonia Copper & Iron Works, Cincinnati, Ohio, for a prominent chemical company. Ansonia was established in 1896, and has always been a customer of Revere—good companies like to do business with each other!

● We wish we could tell you the complete story about the two pieces of chemical equipment shown here. All we can say is that they are fractionating columns, made by Ansonia Copper & Iron Works, Inc., Cincinnati, Ohio, for a well-known company. Both columns are 40 feet high, and one has a diameter of 30 inches, the other 24 inches. Revere supplied phosphor deoxidized copper plates, and copper pipe. Fabricating includes silver brazing with compressed natural gas.

You will find a lot of copper, various types of Revere Copper, in chemical plants. The metal has many advantages, including the highest heat transfer of any commercial metal, complete lack of reaction to many chemical fluids and gases, long life, the high electrical conductivity that is sometimes important, and surprisingly easy fabrication by stamping, bending, soldering, welding, brazing. If you are fabricating or ordering chemical equipment, look into Revere Copper. We will gladly collaborate with you on specification and fabrication matters. Just get in touch with the nearest Revere Sales Office.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

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Mills: Baltimore, Md., Chicago and Clinton, Ill., Detroit, Mich., Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y — Sales Offices in Principal Cities, Distributors Everywhere.

When inquiring check CP 1461 opposite last page

Evaporate... Bake... Dry... at 200° to 1000° F. under Controlled Conditions

- Electric Heating
- Heated Air Filtered and Recirculated
- Closely Controlled Processing Temperature and Product Uniformity
- Corrosion Resistant Oven Construction

Made in wide range of batch type ovens for tray or shelf loading. Available also in steam, gas or oil — direct or indirect heating. Write for Catalog.

W. S. ROCKWELL COMPANY

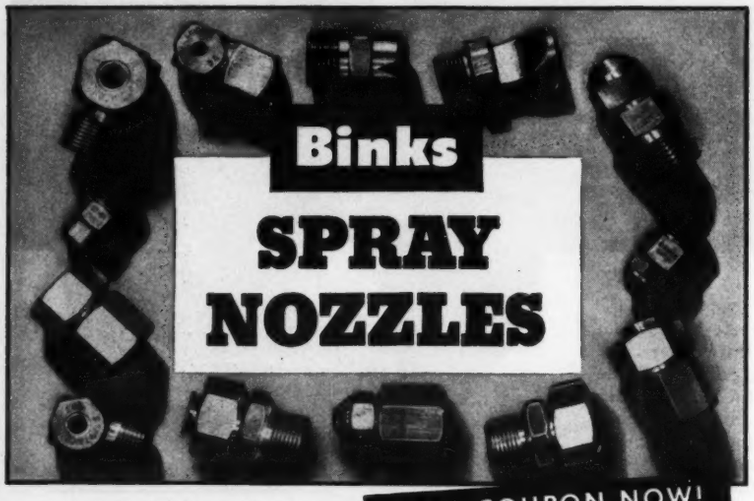
FURNACES • OVENS • BURNERS • VALVES • SPECIAL MACHINERY

ROCKWELL SINCE 1888 BUILT

2205 ELIOT STREET • FAIRFIELD, CONN.

Sales Representatives in Principal Cities

When inquiring check CP 1462 opposite last page



for chemical spraying, cooling, humidifying, dehydrating, and hundreds of other applications.

You'll get the right nozzles quicker by calling Binks...manufacturers of one of the most complete nozzle selections ever produced.

You'll have a wide range of spray patterns, sizes, capacities from which to choose...with nozzles cast or machined from any standard or special corrosion-resistant metals. Send for comprehensive catalog.

Binks Manufacturing Company
3120-32 Carroll Ave., Chicago 12, Ill.

MAIL COUPON NOW!

Binks Manufacturing Co.
3120-32 Carroll Ave.,
Chicago 12, Ill.
O.K. Binks, send me your Spray Nozzle Catalog...

Name_____

Company_____

Address_____

City_____ Zone____ State_____

When inquiring check CP 1463 opposite last page

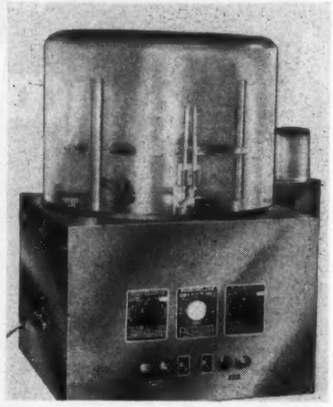
LABORATORY

Recirculating cabinet controls humidity to ±2% ...

uses large inverted glass jar to cover work chamber

Uses: Making quality control and experimental tests to determine effect of varying of humidity upon test material.

Features: Relative humidity can be controlled from approximately 20% to near saturation, depending upon dry bulb temperature.



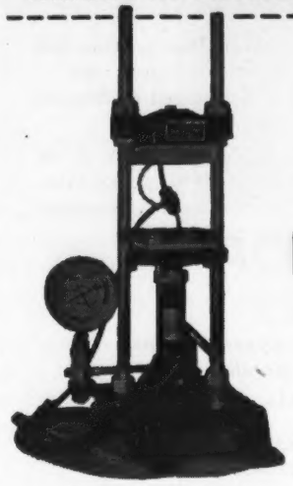
Glass jar allows visible work area

Description: Inverted Pyrex brand jar is used as work chamber. Jar is placed on welded 18-8 stainless steel cabinet which houses wet and dry bulb controls, heavy-duty motor, corrosion-resistant blower, cooling coil and solenoid valve. Aperture of ½" for thermocouple lead-ins or for recording humidity is provided. Wet and dry bulb thermometers, stainless steel water box and wick, adjustable shelf are standard equipment.

Jar is 16" diam x 12"h, contains 1.25 cu ft work area. Unit requires 1200 watts, 115v, 60 cycle AC. Accuracy of wet bulb is within ±2%. Dry bulb accuracy is ±1°F from ambient to 158°F.

(Vapor temp humidity cabinet is product of Blue M Electric Co., Dept. CP, 138th & Chatham St., Blue Island, Ill. . . . or for more information check CP 1464 on handy form opposite last page.)

Standard for Research and Development



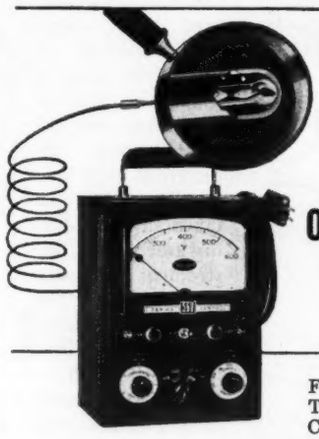
the CARVER LABORATORY PRESS

... wherever Pressing is required.

Accurately controlled pressures to 20,000 lbs.; 6-inch gauge mounted on base. Carver Standard Accessories include Electric or Steam Hot Plates, Carver Test Cylinders, Swivel Bearing Plates, Cage Equipment. Available from stock. Write for catalog.

FRED S. CARVER INC.
HYDRAULIC EQUIPMENT
52 RIVER ROAD, SUMMIT, N. J.

When inquiring check CP 1465 opposite last page



Only Fenwal's *NEW* Precision Instrument Offers This 3-in-1 Temperature Control

Fenwal's new Series 560 Temperature Indicating Control uses the hermetically glass-sealed, steel enclosed thermistor element. It offers sturdy, simplified operation and extra sensitivity in a wide variety of industrial and laboratory applications. It is the only instrument that has such a 3-way control . . . on-off, proportional, adjustable differential . . . *all at the flip of a switch.* It is assured accurate to within ¼ of 1% of full scale, using inexpensive standard wiring up to 200 ft. The thermistor's great resistance change allows use of simple null balance bridge circuit for sure stability in temperatures from 200°F to 600°F, with resulting lower initial cost and minimized maintenance. Send for detailed Series 560 data now to **Fenwal Incorporated, 2410 Pleasant Street, Ashland, Mass.**

Fenwal **Controls Temperature ...*Precisely***

When inquiring check CP 1466 opposite last page

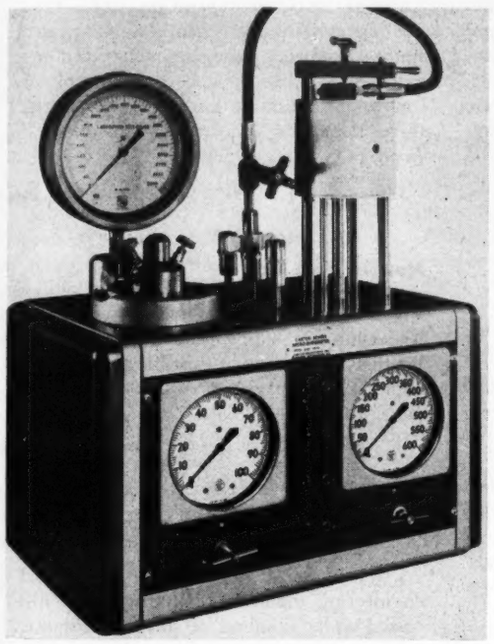
Measures to 5 billion centipoises using 0.1-ml liquid samples . . .

samples are tested by extrusion through calibrated orifice using air pressure

Uses: Determining viscosities of liquids, using only "micro" quantities of material.

Features: Instrument measures viscosities from one to five billion centipoises and requires as little as 0.1 ml of liquid.

Description: Unit is self-contained instrument. Air pressure is applied to material chamber. Sample is tested as it is extruded through calibrated orifice. Capacity is 0.7 ml, although samples small

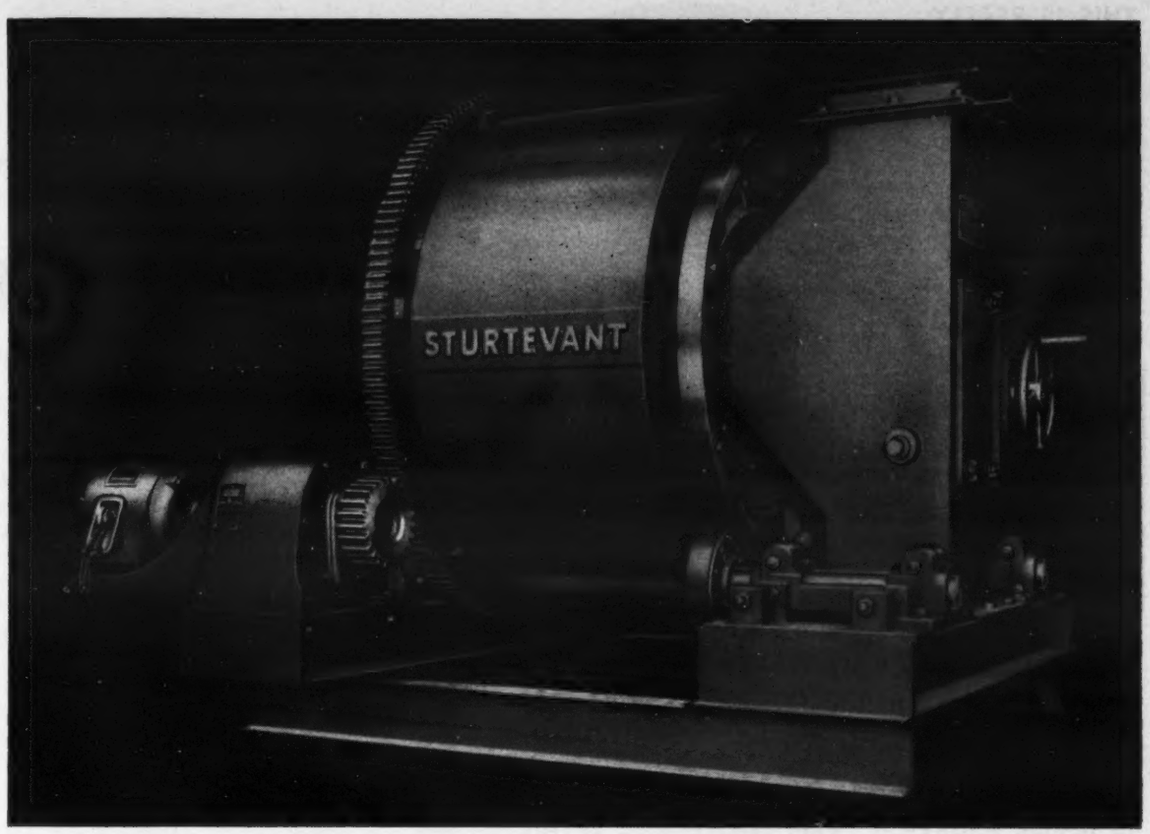


Micro-rheometer uses air pressure to measure viscosities to five billion centipoises

as 0.1 ml can be tested. Temperature range is from approximately 20 to 300°C. Usable pressure range is from zero to 3000 psi. Standard nitrogen cylinder and pressure source are included.

(Model 500 Castor-Severs micro-rheometer is product of Burrell Corporation, Dept. CP, 2223 Fifth Ave., Pittsburgh 19, Pa. . . . or for more information check CP 1467 opposite last page.)

Check the handy product directory, pages 255 to 259, for more laboratory items. All products and ideas discussed in this issue are listed.



STURTEVANT *Dry-Batch* BLENDER

Provides Quick, Thorough Mixing of Materials . . . Cuts Production Costs

Compare These Advantages

- Only one lever controls both receiving and discharging for simplicity of operation. Hand wheel operates rack and pinion slide at feed opening.
- 4-way mixing action speeds production . . . assures thorough blends.
- "Open-door" accessibility permits easy, fast, thorough cleaning.
- Single aperture drum for both intake and discharge.
- Unusually efficient scoops pick up materials to effect thorough mixing as drum revolves.
- 9 models . . . a size for every job . . . from 10 cu. ft. to 900 cu. ft. batches.

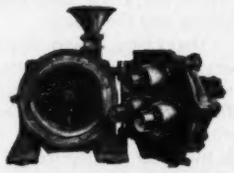
Sturtevant Dry-Batch Mixers are available in standard models with capacities from 500 to 20,000 lbs. Special models with higher capacities are also available. Write for information or engineering assistance.

Sturtevant Mill Company
119 Clayton Street, Boston 22, Mass.

DESIGNERS & MANUFACTURERS OF
CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS
MECHANICAL DENS AND EXCAVATORS • ELEVATORS • MIXERS

Other Sturtevant Equipment for Increasing Production

MICRONIZER® GRINDING MACHINE
A fluid jet grinding machine, the Sturtevant Micronizer speeds reduction of materials to low micron sizes. These jet mills are especially applicable in fields where a particle size in microns is desired. Available for outright sale.



RING-ROLL MILLS
For medium and fine reduction (10 to 200 mesh), hard or soft materials. Very durable, small power. Operated in closed circuit with Screen or Air Separator. Open door accessibility. Many sizes. No scrapers, plows, pushers, or shields.

AIR SEPARATOR
For separation of fines to 325 mesh and finer. Increases output from 25% to 300% . . . lowers power costs by 50%. Capacities ¼ to 50 tons per hour output.

SWING-SLEDGE MILLS
For coarse and medium reduction (down to 20 mesh). Open door accessibility. Soft, moderately hard, tough or fibrous substances. Built in several types and many sizes.

When inquiring check CP 1468 opposite last page

THIS IS REALLY CONTINUOUS FILTRATION

21 FEET OF UNBROKEN FILTER CAKE

24 HOURS A DAY . . . with FEinc STRING FILTERS

The clean, unbroken sheet seen here is composed of refined kaolin which is coming off the discharge end of a FEinc String Filter at J. M. Huber Corporation, Huber, Ga. The uniformly dewatered cake, although of a sticky character, is cleanly lifted from the revolving filter drum by closely spaced strings which carry the clay blanket to the discharge roll, where it drops into the trough.

The FEinc String Filter is successfully delivering cleaner, dryer cakes with materials ranging all the way from thin, soupy slimes, colloidal gels, greasy waxes, etc., to flocculent, fibrous or crystalline cakes . . . with less "down time" and lower maintenance costs. In a surprising number of cases this FEinc is the most economical of all filters for the "easy" jobs as well as the tough ones.

The FEinc String Discharge Filter is only one of many continuous filters now made by Filtration Engineers. Our engineering service is the finest available, backed by 35 years of experience, and backed by the ability to deliver filters that are tailor-made to fit the job . . . at no more than standard costs. Write or telephone us today for more details.

Test the actual performance of FEinc . . . at low cost . . . rent this small pilot-plant filter with interchangeable string or scraper discharge. Write for facts.

Filtration Engineers, Inc.

CUSTOM DESIGNERS AND MANUFACTURERS OF ALL TYPES OF CONTINUOUS FILTRATION EQUIPMENT

FEinc

42 155 ORATON STREET • NEWARK 4, N. J.

When inquiring check CP 1469 opposite last page

briefs

from contemporary publications

Metallurgical statistics

A consolidated computer is applied to the solution of a metallurgical regression problem. The study is planned, data are gathered and prepared for the computer, the computer is described, calculations are made, and suggestions for a follow-up study are presented. Six pages, five tables, one figure, 21 references. (*"Industrial Quality Control," June,* 1955, *page* 8.)

Cast elastomers

Butyl acrylate elastomers cast from latex constitute a lifelike cover for mechanical hands for amputees. This presentation covers refractive index, low-temperature behavior, latex and solvent cast films, and physical properties. Five pages, three tables, six figures, 17 references. (*"Industrial and Engineering Chemistry," June,* 1955, *page* 1209.)

Pulpwood from residues

In a discussion of the problems and opportunities for pulpwood from small sawmill and logging residues, author surveys residues, and covers accessibility, competing uses, and salvage methods. Four pages, five tables, two photographs. (*"Journal of Forestry," June,* 1955, *page* 416.)

Sludge filter blankets

Selection and care of sludge filter blankets in a sewage disposal plant are outlined. Installation of blankets, detergent and acid washes, and specific qualities of cloth are discussed. Six pages, one table, five photographs. (*"Water and Sewage Works," June* 1955, *page* 216.)

Chemical control of corrosion

This evaluation of chemicals for control of corrosion covers deoxygenation, sulfur compounds as reducing agents, sulfite-treated water, hydrazine, and amines. Operating experience, hazards, and pH control of condensate return are discussed. Four pages, three figures. (*"Mechanical Engineering," June,* 1955, *page* 495.)

How to be a leader

Practical suggestions as to how to attain leadership are supplemented with a check list that enables one to gage his qualities and ability. Three pages. (*"Mill and Factory," June,* 1955, *page* 75.)

Polyethylene

As a material of construction in chemical engineering industries, polyethylene is discussed under headings of solvent resistance, ageing and weathering, fabrication, applications, and future outlook. Attention is accorded to mechanical, chemical, and electrical properties. Six pages, three tables, 16 figures, four references. (*"Chemical Engineering Progress," June,* 1955, *page* 251.)

Halogenated ethanes and ethylenes

This paper deals with vapor pressures, critical constants, densities, liquid viscosities, and liquid enthalpies of halogenated ethanes and ethylenes. Equations of state and pressure-temperature correlations are given. Six pages, seven tables, two figures, 19 references. (*"Industrial and Engineering Chemistry," July,* 1955, *page* 1449.)

abstracts of pertinent articles in other industrial publications . . . selected by CP editors as a service to you . . .

Crushing and grinding

From England comes a survey of theory and practice of size reduction. Attention is accorded primary and secondary crushing, fine grinding, materials of construction, new machines, and industrial techniques. Five pages, three tables, 68 references, four photographs. (*"Chemical and Process Engineering," June,* 1955, *page* 199.)

Tester for pliability

Wrappability is measured by means of a new tester for use with paper, foil, and films. Eight pages, three tables, two figures, 12 references. (*"Modern Packaging," July,* 1955, *page* 127.)

Research directors

What management expects of a research director is outlined. Eighteen solid clues for the successful head of a research department are given. Six pages. (*"Research and Engineering," July,* 1955, *page* 38.)

Material handling

This survey of modern methods of handling materials in pulp and paper mills deals with belt and cable conveyors, chip bins, and automatic wrapping machines. (*Paper Trade Journal," July* 18, 1955, *page* 18.)

Analytical laboratory

Operation of a petroleum research analytical laboratory is described. Handling of samples, printed forms, and special equipment are covered. Preparation of weekly and monthly progress reports is included. Seven pages, 10 figures, five references. (*"Analytical Chemistry," July,* 1955, *page* 1040.)

Heat transfer in paper dryers

This discussion of heat transfer in paper dryers covers factors involved, underlying fundamentals, contact resistance, and correlation of data. Five pages, three figures, eight references. (*"Paper Mill News," July,* 1955, *page* 48.)

Metals in distillates

Two closely allied papers are devoted to the determination of trace metals in petroleum distillates and to efficiency of methods of recovery. (*"Analytical Chemistry," July,* 1955, *page* 1283.)

Recovery of black liquor

These studies of the chemical and thermal recovery of black liquor embrace large and small paper mills and include detailed sample calculations. In English. Six pages, six figures. (*"Papier Carton et Cellulose," July and August,* 1955, *page* 87.)

Zirconium

This survey of variations and modifications of the Kroll process for the production of zirconium covers studies of reduction, zirconium chloride, magnesium chloride, and gravity drainage. Six pages, 12 figures, six references. (*"Chemical Engineering Progress," July,* 1955, *page* 320.)

Selecting boiler feed pumps

Author shows how system head curves enable one to choose proper boiler feed pump. Fluctuating capacities, parallel operation, and differential pressure governors are considered. Four pages, three figures. (*"Paper Trade Journal," July* 25, 1955, *page* 22.)

easily installed in split-case pumps

This new addition to the "JOHN CRANE" family of anti-corrosive Type 9 Seals is the answer to a simplified means of seal installation (or removal) in modern split-case pumps.

Need for unbolting the upper half of the casing is eliminated, since the unit is mounted on a sleeve with an outside clamping ring.

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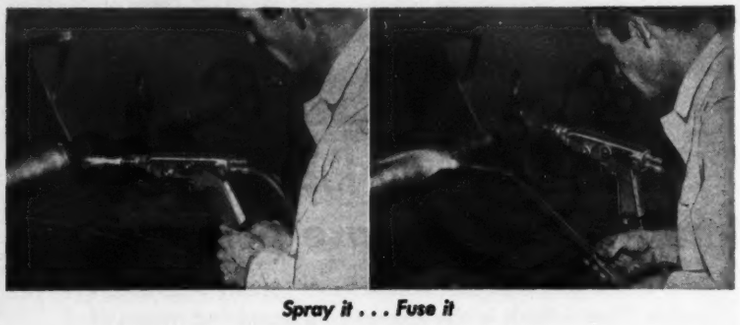

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The COLMONOY Spraywelder applies COLMONOY alloys to the wear areas of any metal part. The sprayed overlay is then welded to the base metal by fusing it with an oxy-acetylene torch. The even application makes the removal of more than .010" per side in finishing very rare.

A COLMONOY Sprayweld surface is non-porous, non-sparking, and has a low coefficient of friction. It resists corrosion, abrasion, and oxidation.

This acid sludge pump plunger was being repacked every 8 hours, and replaced every 24. At half the cost of new plungers, Spraywelding with COLMONOY NO. 6 *stretched repacking intervals to 60 hours, and increased total life to 573 hours.*

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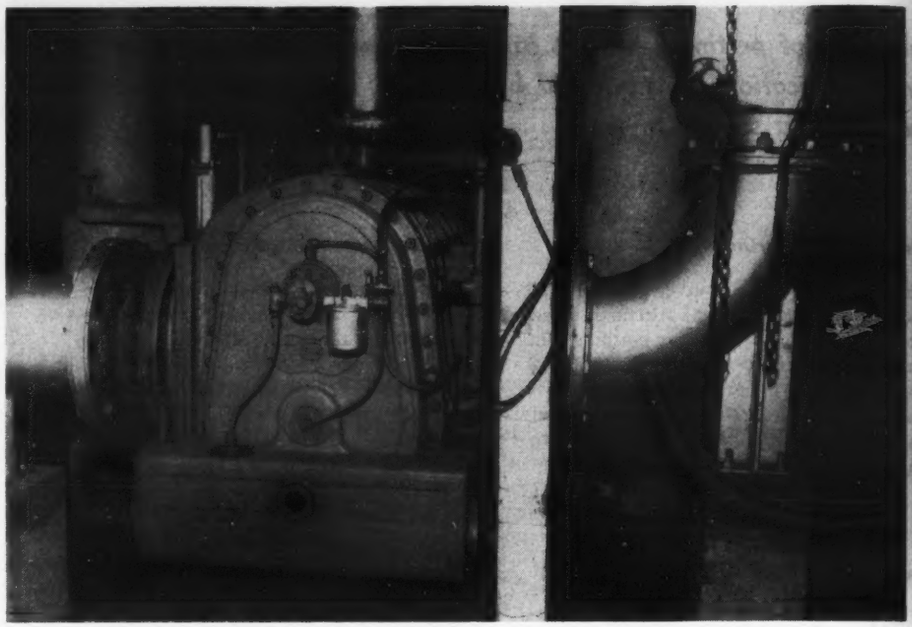


One of the three air blowers at Spencer's Henderson, Kentucky, ammonia plant

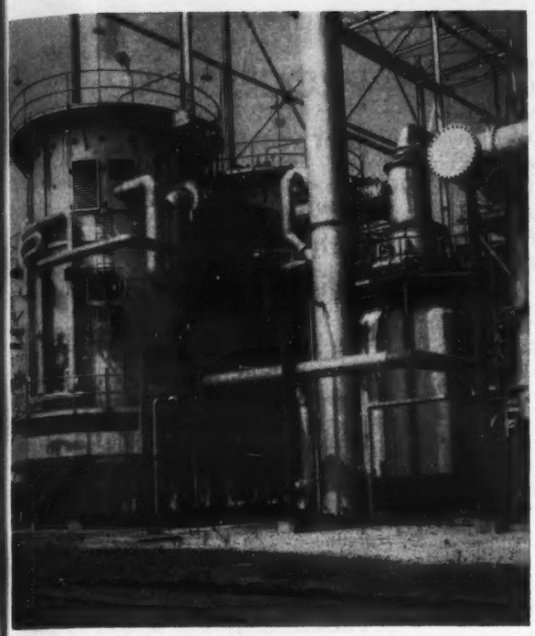
Feeding 84,000 tons of process air annually — many times at overload pressures — and still . . .

Spencer Chemical's air blowers need no maintenance in four years

Operating 24-hr a day — sometimes for month-long periods in excess of rated pressure — three blowers have stood up for four years under this punishment, and are asking for more. They have given no mechanical trouble, have required no maintenance.

Wesley M. Yeandle, Production Superintendent at Spencer Chemical's Henderson, Kentucky, ammonia plant, declares that in this respect the blowers are unlike any other piece of equipment in the plant. These blowers are used to force air to the secondary reformers of the plant. They were installed new about four years ago when Spencer purchased the plant from the government. Today, 82,000 tons of NH_3 are produced annually. In addition to agricultural uses, the anhydrous ammonia finds application in making synthetic fibers and in the steel industry.

Driven by 190 hp steam turbines, the blowers pump 84,000 tons of air every year. Two of the blowers each supply one of the reformers, while the third is used as a standby. Blowers normally operate at 1750 rpm and deliver about 4600 cfm at 8 psig discharge



The blowers feed air to these converters

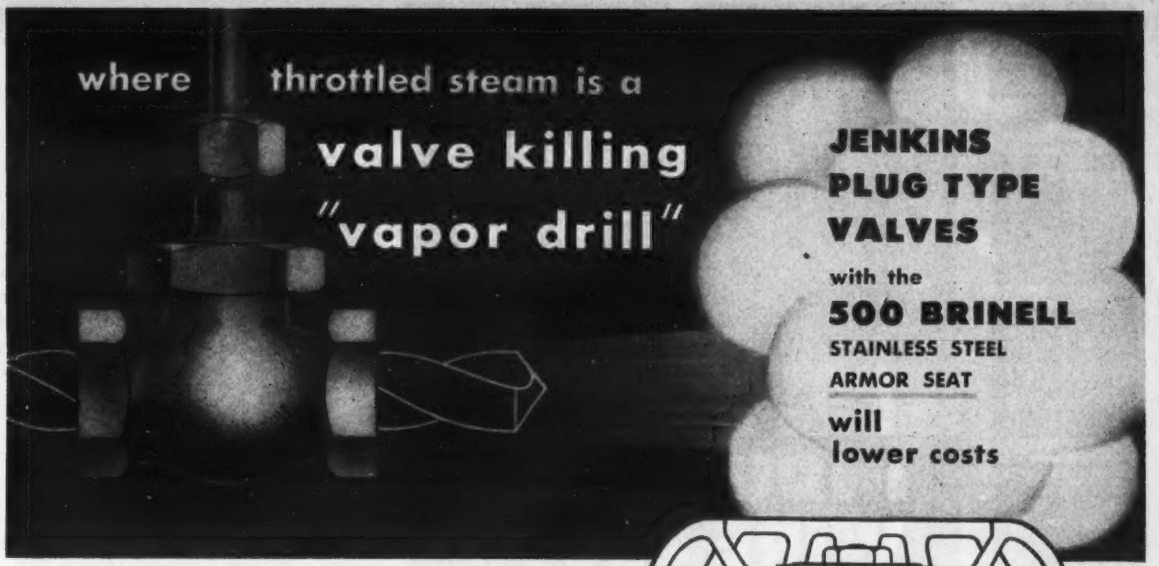
pressure. Sometimes, however, it is necessary to raise discharge pressure to 10 to 12 psig, or even more, in order to force air through the reformer when the catalyst bed has been clogged by brick and catalyst dust. Eventually, of course, the resulting loss in production forces an overhaul of the reformer bed, but this may be put off for some time by raising blower pressure. Blowers have been run as long as one month under overload. In spite of such increased duty, no blower trouble has yet been encountered.

Blowers work on the principle of internal compression effected between two intermeshing screw-type rotors with helical grooves and lobes. The female or gate rotor is provided with grooves, while the male or main rotor has lobes.

The grooves and the lobes actually never touch, although the clearance between them is small — in the range of a few thousandths of an inch. Because there is no contact between male and female rotors, there is no internal wear and no need for internal lubrication. This is important in an ammonia plant since oil impurities in the process gasses cannot be tolerated.

Automatic control is used. Through an instrument panel, the blowers are regulated to supply air so that a final 3:1 ratio of H_2 to N_2 is obtained before passing to the ammonia converters. Exact amount of air may vary with process fluctuations, but manual adjustment of blowers is seldom required.

(Blowers are product of Blower-Stoker Div., Read Standard Corp., Dept. CP, 370 Lexington Ave., New York 17, N.Y. . . . or for more information check CP 1472 on handy form opposite last page.)



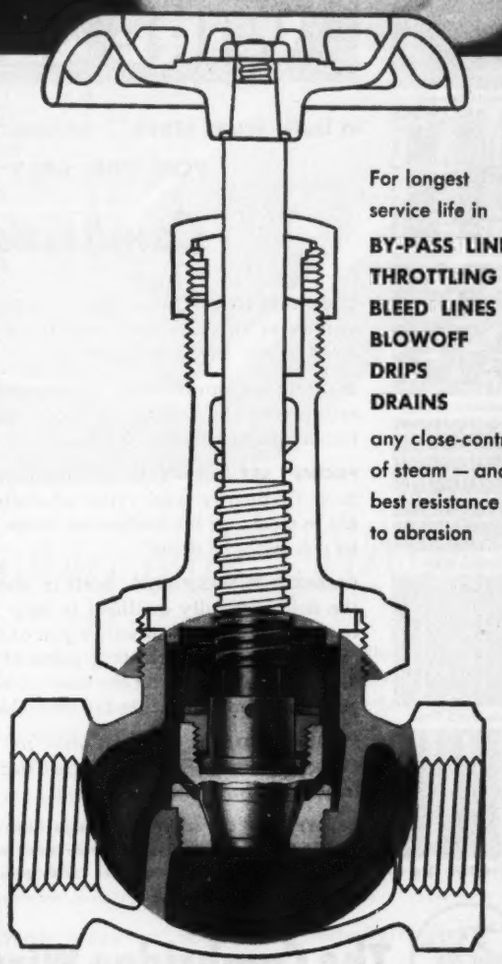
Closely regulated steam erodes grooves in seating units and drastically cuts service life of ordinary valves.

Jenkins Plug Type Valves have been engineered in every detail for maximum wear in such valve-killing service. The stainless steel Armor Seat defies the "vapor drill", and Jenkins quality throughout gives them top rating for wear-proof and trouble-proof perfomance.

Make you own test . . . in your toughest steam service . . . or anywhere that abrasion or erosion causes frequent valve failure. Compare, part for part, with any similar valve. You'll find that, again, Jenkins *extra value* pays off in longer life and lower maintenance cost.

Plug and seat ring are Jenkins JX500, a Stainless chromium alloy steel made to Jenkins high strength specifications, heat-treated to 500 Brinell. Seating surfaces are super-hard and mirror-smooth, offer highest resistance to galling, cutting, abrasion, and erosion. Wide, steep, 30° total taper permits extremely close regulation of flow and vapor-tight closure.

The Stainless steel plug is securely fastened to the spindle with a bronze locknut. Spindle is aluminum bronze with a tensile strength exceeding 70,000 lbs., — has high corrosion resistance.



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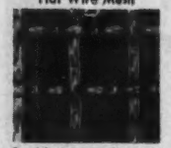
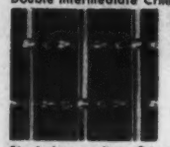

Double Intermediate Crimp


Single Intermediate Crimp

Double Crimped

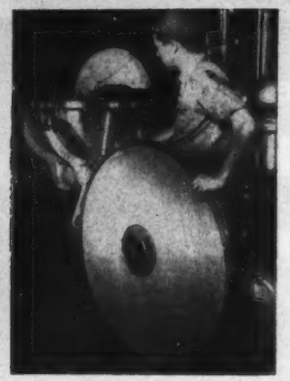
Twilled Weave

Calendered Backing

Oblong Mesh

Plain Dutch Filter

Twilled Dutch Filter



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Steel reference handbook and stock list

Handbook of 256 pages contains information on practically every type of steel, including beams, channels, bars — strip and hot-rolled, plate, sheets, alloys, stainless, tool and tubing. Descriptions, sizes, weights, specifications and cutting details are given. Over 10,000 different steels, shapes and sizes are grouped and indexed. Manual also includes price data and cutting charges. Book covers only steel available at manufacturer's Chicago plant.

Stock List and Reference Book is available on letterhead request from J. T. Ryerson & Son, Inc., Dept. CP, P.O. 8000-A, Chicago 80, Illinois.

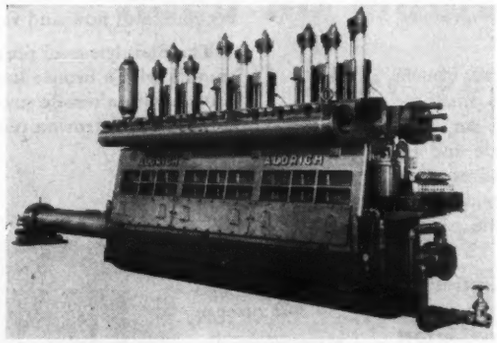
High-speed operation, compactness offered by heavy-duty pumps . . .

9-plunger units have capacities to 1520 gpm

Uses: For heavy-duty pumping applications.

Features: These 9-plunger reciprocating pumps offer advantages of positive displacement, high-speed operation, compact construction, interchangeability of parts, low maintenance, and minimum discharge variation.

Description: Rated at 900 bhp, pumps operate at speeds up to 300 rpm and have pumping capacities up to 1520 gpm, or 52,200 bbl per day. They are available with six interchangeable fluid ends and 20 plunger diameters. Plunger diameters range from 2 to 5¼" in increments of either ⅛ or ¼". Changes in speed and plunger sizes permit a wide range of pumping capacities, giving any desired intermediate throughput.



Total discharge variation of pump is less than 2½%

Units are suitable for drive by engine or synchronous engine-type motor. Crankshaft is located near floor, which eliminates need for expensive foundations to raise driver or need to lower pump below floor level.

All wearing parts in this 6" stroke series are inter-

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Main Products

changeable between 3, 5, 7, and 9-plunger units, except crankshaft. Because fluid end is sectionalized in construction, maintenance is simplified and less costly.

(Nonuplex direct flow pumps are products of Aldrich Pump Company, Dept. CP, 30 Pine Street, Allentown, Pa. . . . or for more information check CP 1475 on handy form opposite last page.)

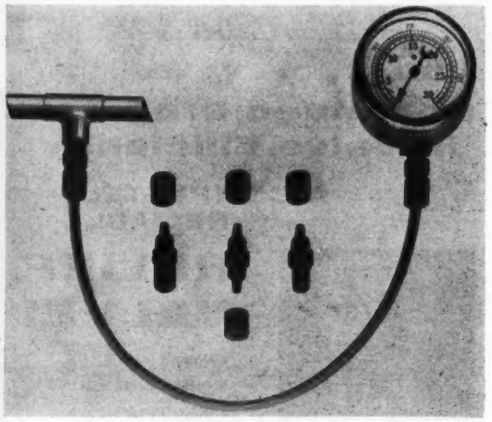
Adaptors and fittings of PVC resist rust and rot . . .

suitable for tube-to-tube or tube-to-pipe connections in ¼ and ⅜" sizes

Uses: For many flexible liquid- and air-tight instrumentation tubing connections. Fittings are suitable for tubing-to-tubing and tubing-to-pipe connections in ¼ and ⅜" size range.

Features: Strong, yet lightweight, the anti-corrosive properties of polyvinyl chloride make fittings highly resistant to such acids as nitric, sulfuric, hydrochloric, and hydrofluoric.

Adaptors and unions are non-flammable, rust- and rot-proof — require no coating or painting. They will withstand working pressures of 125 psi.



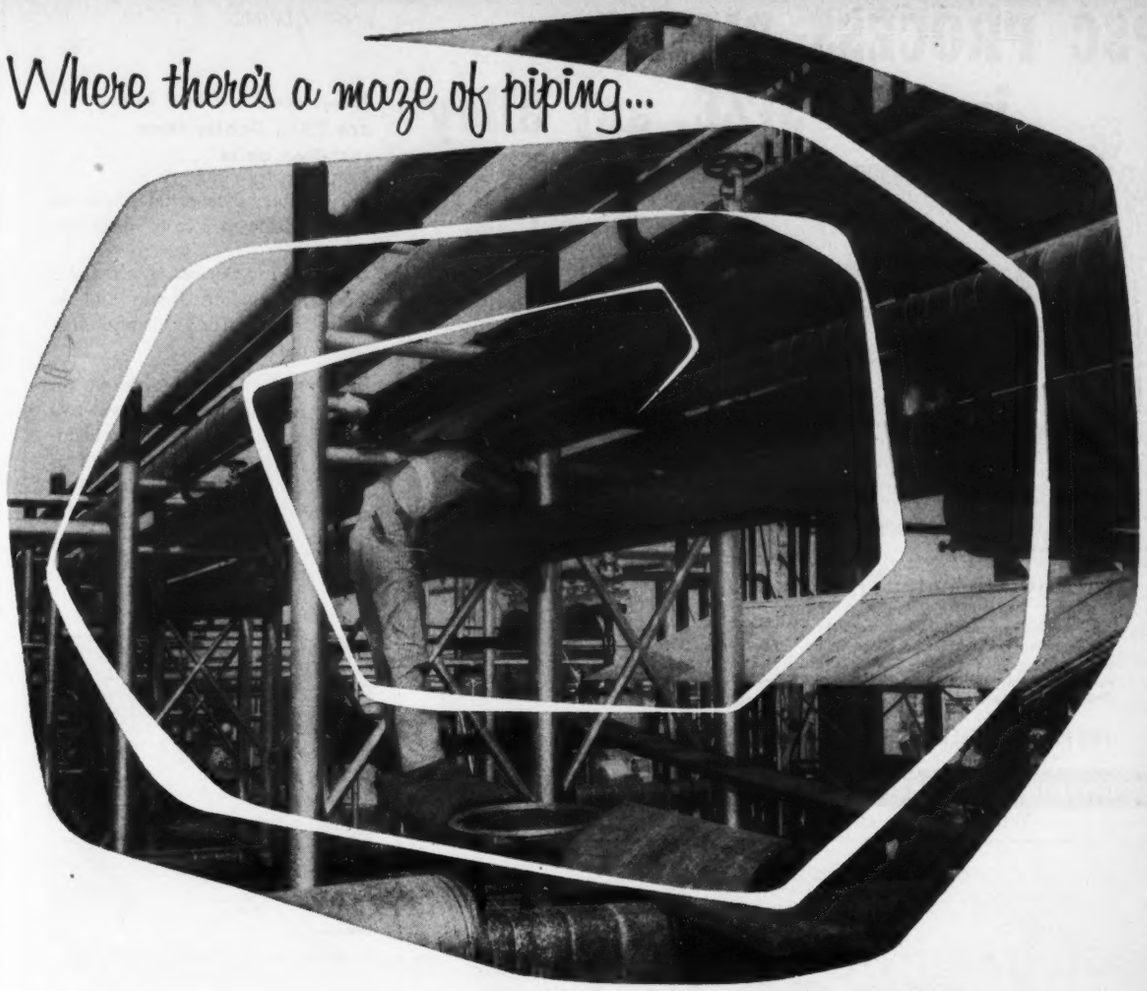
PVC fittings require no coating or painting

Description: Adaptors are suitable for connecting ¼ and ⅜" tubing to ⅛ and ¼" pipe. The unions connect ¼ or ⅜" tubing. Larger adaptors and unions suitable for ½" tubing are available.

Adaptors have a tapered nozzle which fits into tubing. A screw cap slips over tubing, engages threads in adaptor and draws tubing and adaptor together into a liquid-tight, air-tight connection.

(Polyvinyl chloride fittings and adaptors are products of S. & C. Manufacturing Company, Dept. CP, 6245 Wiehe Road, Cincinnati 13, Ohio . . . or for more information check CP 1476 opposite last page.)

Where there's a maze of piping...



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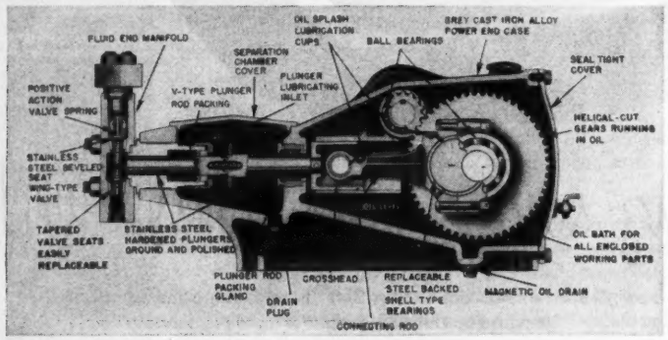
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Pre-assembled ball joints are 25% lighter than cast-iron units . . .

flexible, sheet-metal joints are available in 3 to 8" diameters

Uses: In exhaust systems for dust and noxious fumes and in blower systems for air conditioning and ventilating.

Features: Only 25% of weight of a conventional cast-iron ball joint, sheet metal units are economical in their initial cost as well as in shipping and installation. Preassembled, flexible ball joints are of three-piece construction and are easily positioned. No heavy supports are necessary.

Joints are electro-zinc-plated for corrosion-resistance

Description: Flexible ball joints are available in eight pipe sizes, ranging from 3 to 12" in diameter. The 7 and 9" sizes provide a total arc of 45°; all other sizes permit 55° total deflection.

(Pre-fabricated sheet metal flexible ball joints are products of Spincraft Inc., Dept. CP, 4132 West State Street, Milwaukee, Wis. . . . or check CP 1480 opposite last page.)

Describes self-flaring tube fitting

Self-flaring tube fitting for hydraulic pressures is described in four-page, illustrated bulletin.

Cat BA 555 is issued by Flodar Corp., Dept. CP, 1366 E. 45th St., Cleveland 3, Ohio. Specify CP 1481 opposite last page.

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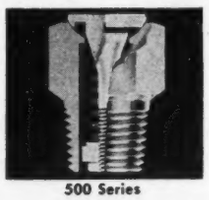

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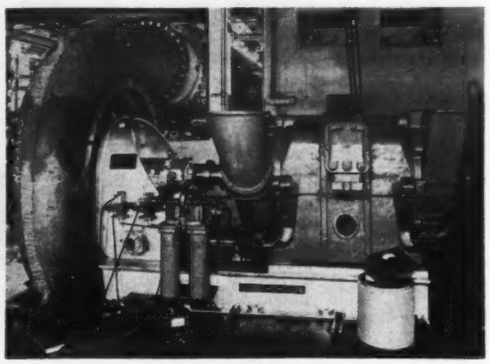
Around-the-clock operation for 43,200 cfm compressor in outdoor location . . .

will act as air lift and combustion blower for catalytic cracking unit

Installed at Canadian Petrofina, Ltd., Pointe Aux Trembles, Quebec, refinery, centrifugal compressor will deliver 43,200 cfm of air. Designed for around-the-clock operation, compressor acts as combination air lift and combustion blower for refinery's 16,000 barrel-a-day Houdriflow catalytic cracking unit. Drive is provided by a 1250-hp, 3600 rpm electric motor supplied by ACEC Electric Corp.

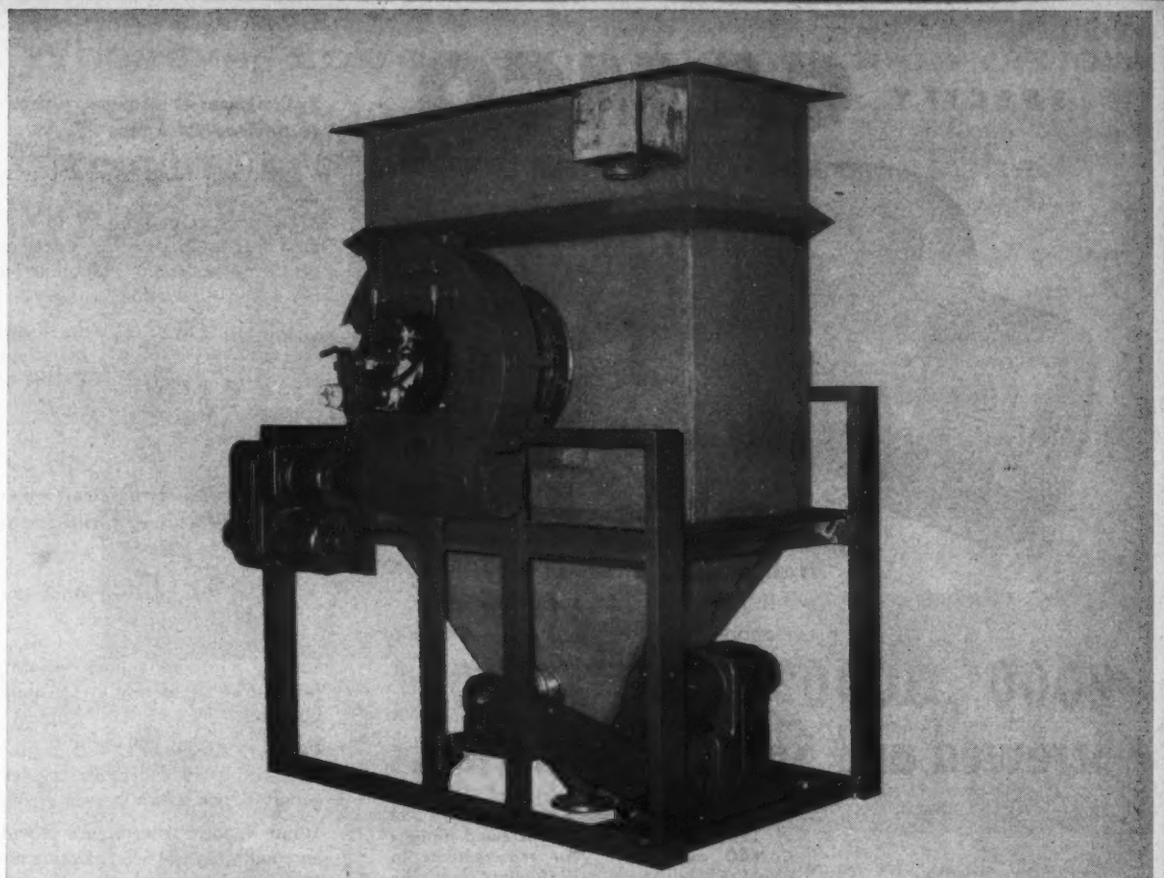


Pre-installation testing of compressor motor for Houdriflow catalytic cracking unit

(Centrifugal compressor is a product of American Blower Div., American Radiator and Standard Sanitary Corp., Dept. CP, 101 Franklin St., Kewanee, Ill. . . . or for more information about manufacturer's product check CP 1484 on handy form opposite last page.)

Your guide to more ideas concerning Engineering and Maintenance . . .

is the handy Product Directory on pages 255 to 259. All products and services discussed in this issue, in either editorial or advertising, are listed there.



Another Eimco Continuous Vacuum Filter

The machine pictured is built as two different machines. One contains a drum type filter with a top feed for drying sand or other crystalline materials. The other contains a disc type thickener filter which runs completely submerged. It is built with a large port for carrying the clarified product or filtrate and a small port arranged to admit a small amount of blow at the bottom sector for dislodging the thickened material so that it can be discharged at the bottom of the tank.

These are special filter applications and examples of developments in liquid-solids separation through filtration.

Eimco, with more than half a century of experience in serving the process industries, makes drum, disc, pan, pressure, plate and frame and tubular type filters with numerous attachments that can be applied to processing industries with difficult filtration problems.

Write for complete information.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas Vancouver, B. C. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-140

When inquiring check CP 1485 opposite last page

Splits foam or sponge rubber to desired thickness . . .

machine handles most soft materials easily

Splitting machine will cut to any desired thickness most soft material such as foam rubber, sponge rubber, felt, insulation, and similar materials. Machine has automatic winding.

(Splitting machine is produced by Case-Maul Manufacturing Co., Dept. CP, Mansfield, Ohio . . . or for more information check CP 1487 opposite last page.)

Condensation protection offered by insulation over temp range of −120 to 250°F . . .

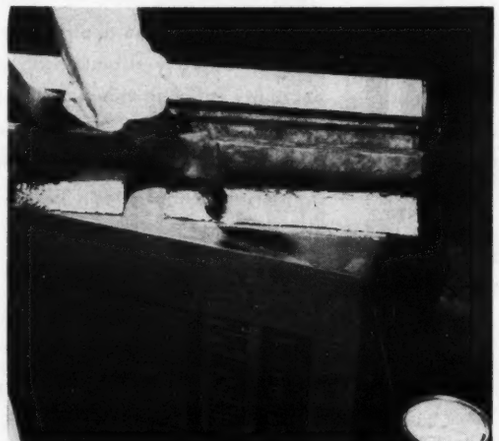
glass fiber material won't rot or corrode, provides neat appearance

Uses: Insulating lines operating at low temperatures or at alternating cycles of high and low temperatures.

Features: Product will withstand temperatures from −120 to 250°F. It includes a factory-applied vapor barrier which prevents condensation.

White vapor barrier jacket provides a neat appearance and does not need painting under dry conditions. Because of its stable, inert fibers of glass, insulation gives long service, won't rot or corrode.

Description: Pipe insulation will fit all standard pipe sizes to 33″ diam and copper tubing to six inches. For pipe sizes up to and including 12″ diam, insulation is furnished in hemi-cylinders with vapor barrier attached. For larger pipes it is supplied in three segments to 28″, in seven segments to 33″ and jacket is supplied separately.



A lap cement is used to seal longitudinal and transverse joints of vapor barrier jacket of insulation prior to application

SPECIFY **CAMCO**

Heavy Duty stainless pipe fittings when high pressure, temperature and corrosive conditions require their use.

2000#, 3000#, 4000# and 6000# Screwed and Socketweld Fittings

In addition to manufacturing a complete line of 150 lb. stainless steel screwed fittings CAMCO can supply your requirements in pressure rated heavy duty stainless steel pipe fittings. Most of the popular sizes and items are available from stock in types 304, 304ELC, 316 and 316 ELC stainless steel screwed and socketweld fittings. Wide reinforcing bands insure maximum strength at points of stress and extend well beyond the last thread or depth of socket. All fittings permanently identified with size, alloy, pressure rating, heat code and trademark.

FILL IN AND MAIL TODAY

CAMCO Products, Inc., 445 State Street
North Haven, Conn. CP

☐ Please send Flange Dimensional Slide Rule.
☐ Catalog No. 653 covering complete line.
☐ Furnish address of area distributor.

Name .....
Company .....
Address .....
City ..... State .....

THE *Quality* LINE IN STAINLESS
CAMCO
PRODUCTS, INC.
445 STATE STREET
NORTH HAVEN, CONN.

When inquiring check CP 1486 opposite last page

Uniform Class 3 Fit
BOLTS NUTS STUDS

TITANIUM
- Carbon Steel
- Alloy Steels
- Stainless Steels
- Silicon Bronze
- Naval Brass
- Monel Metal

You can depend on a uniform Class 3 fit if required when you buy Pawtucket threaded fasteners. Standard items or specialties — all Pawtucket products are accurately made in standard dimensions or to your specifications. Heat treating with precision-controlled modern equipment.

BETTER BOLTS SINCE 1882

PAWTUCKET
MANUFACTURING COMPANY
327 Pine St. • Pawtucket, R. I.
THE PLACE TO SOLVE YOUR BOLT PROBLEMS
T.M. REG.
"The Bolt Man"

When inquiring check CP 1488 opposite last page

Insulation is fastened in place with metal bands. It is available in nominal thicknesses of 1, 1½, 2, and 2½". All conform to simplified dimensional standards or "nesting" sizes, permitting multiple-layer build-up of insulation to any desired thickness.

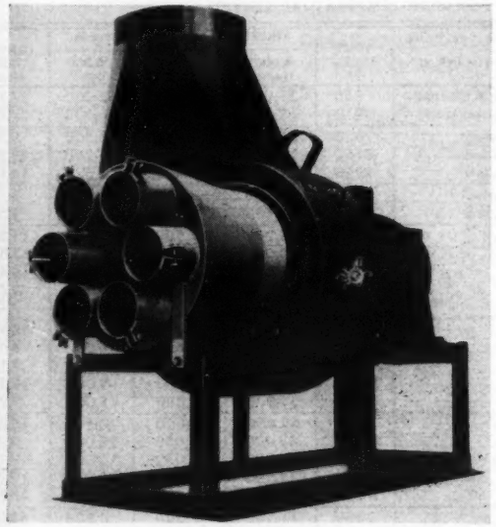
(White dual-temperature pipe insulation is a product of Owens-Corning Fiberglas Corp., Dept. CP, 1833 Nicholas Bldg., Toledo 1, Ohio . . . or for more information check CP 1489 on handy form opposite last page.)

Exhausts up to 3500 cfm of air from several separate spaces or single working area . . .

can be quickly converted from exhauster to fresh air supplier

Uses: Remove gases, fumes, smoke, and abrasive dust from groups of machines, crew welding operations and a variety of industrial operations.

Features: Blower-exhauster will deliver up to 3500 cfm of air through six separate nozzles or a single large nozzle. Unit operates in any position and can be quickly changed from exhauster to fresh air supplier by changing the position of adapter.



Blower-exhauster will accommodate up to six separate nozzles or a single large nozzle

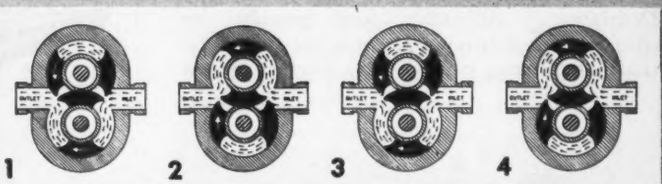
Description: Blower-exhauster has newly designed heavy duty blower wheel and 3 hp ball bearing motor. It will operate effectively with 100′ of flexible hose. Caps are provided for nozzles not in use.

(Type OPS Blower-exhauster is a product of Chelsea Fan and Blower Co., Inc., Dept. CP, 639 South Ave., Plainfield, New Jersey . . . or for more information check CP 1490 on handy form opposite last page.)

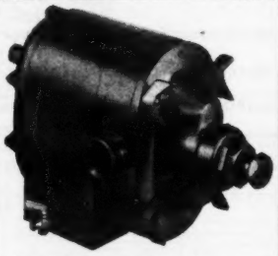
Whenever corrosive products of high or low viscosity are to be pumped smoothly with a minimum of leakage, the answer is the Waukesha P. D.* Pump

. . . this sanitary pump . . . with positive displacement action guarantees smooth pumping operation

. . . is so simple to disassemble, wash, sterilize and assemble. The smooth surfaced O-Ring rotary seal flips out easily and snaps back in place with slight pressure.

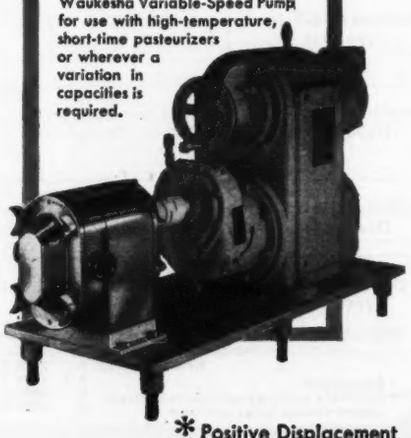


The product flow diagram illustrates the position of the twin blade impellers at each quarter turn of the rotors. The four large chambers draw in and discharge four full loads with every revolution. This action is so precise, so closely timed that the product-flow is smooth and even—practically without pulsation.



Waukesha Vented Pumps are easily adjusted for back pressure.

Waukesha Variable-Speed Pump for use with high-temperature, short-time pasteurizers or wherever a variation in capacities is required.



* Positive Displacement Sanitary Pump.

● Designed for "tough" pumping jobs in the chemical industry where volatile, corrosive or hot materials of low or high viscosity are being transferred, is the Waukesha positive displacement pump with the spring-loaded John Crane rotary seal. This pump and seal combination minimizes leakage problems.

Waukesha positive displacement, corrosion-resistant, stainless steel pumps are renowned for their precision performance and dependable operation. With positive displacement pumping, you eliminate the turbulence, churning, agitation and aeration so damaging to most products. With smooth product flow you reduce your plant processing problems.

Valuable assets where pumps are used to handle various products one after another are these Waukesha features—pumps require a minimum of time to dismantle, clean and assemble; they are easy to wash and sterilize; pump parts are smooth and flush; there are no hard-to-reach, hard-to-clean recesses . . . completely sanitary.

Waukesha has a P.D. pump to serve you in the chemical, textile, pharmaceutical, rubber, petroleum, or petrochemical industry. Write the Waukesha Foundry Company, Dept. 10P Waukesha, Wisconsin, for complete details.

Waukesha Foundry Company

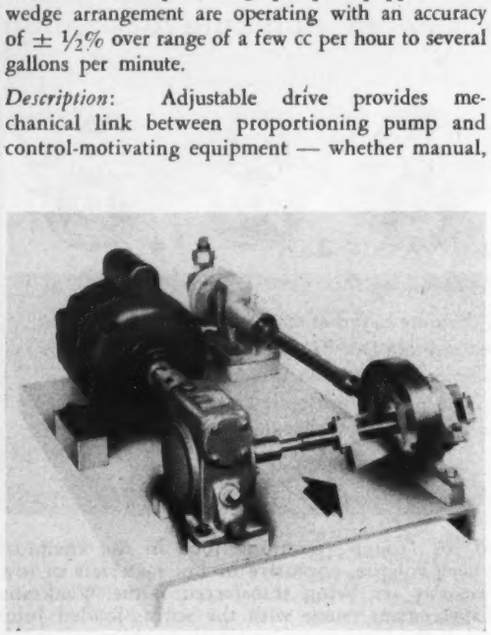
When inquiring check CP 1491 opposite last page

Uses wedge for stepless adjustment of proportioning pump capacity

Uses: For adjustment of piston-stroke length and hence pump capacity while running, to accomplish accurate metering in relation to temperature, flow, pH value, liquid level, pressure, and other meterable factors.

Features: Proportioning pumps equipped with wedge arrangement are operating with an accuracy of ± ½% over range of a few cc per hour to several gallons per minute.

Description: Adjustable drive provides mechanical link between proportioning pump and control-motivating equipment — whether manual,



Inclined plane or wedge (arrow) is used for adjustment of piston-stroke length

hydraulic, pneumatic or electric — for adjustment of piston-stroke length.

It uses one of the oldest principles of mechanical advantage — that of inclined plane or wedge. By moving wedges through slot in cam, variable eccentricity is obtained. Long taper of wedges (12.5 to 15 degree angle) permits stepless adjustment from zero to maximum piston-stroke to eliminate "hunting" for correct adjustment.

(Philatrol is development of the Philadelphia Pump and Machinery Company, subsidiary of American Meter Co., Dept. CP, 1513 Race Street, Philadelphia, Pa. . . . or for more information check CP 1492 opposite last page.)

Find surface of normal alkanes handily with the nomograph on page 248

See Us At the Chemical Show, Booth 75, Convention Hall, Philadelphia, Dec. 5-9

STRESS RUPTURE DATA ON B&W CROLOYS
AND OTHER TUBULAR MATERIALS FOR HIGH-TEMPERATURE SERVICE

MATERIAL	ANALYSIS, Per Cent	HEAT TREATMENT	TEST TEMP. (F)	STRESS, psi, to Cause Rupture in 1,000 Hours	10,000 Hours	100,000 Hours*	LONGEST TEST, Hours
MEDIUM CARBON STEEL	C .35 max; Mn .80 max; Si .10 min	Hot Rolled & Annealed	850	21,000	16,000	12,000	27,224
		Hot Rolled & Annealed	950	12,500	8,800	6,100	27,961
CROLOY 2¼	Cr 2.00-2.50; Mo .90-1.10	Annealed	1000	21,000	16,800	13,500	9,240
		Annealed	1100	13,600	10,000	6,200	29,286
		Annealed	1200	7,600	4,400	2,550	15,189
CROLOY 7	Cr 6.00-8.00; Mo .45-.65	Annealed	1200	5,900	4,300	3,100	3,106
		Annealed	1300	3,400	1,900	1,130	1,525
CROLOY 18-8 S (Type 304)	Cr 18.00-20.00; Ni 8.00-11.00	A	1050	33,200	24,500	18,000	11,858
		B	1050	35,000	23,000*	13,500	7,863
		A	1200	21,500	16,500	13,000	10,646
		B	1200	20,000	15,500	11,500	9,752
		S	1200	21,000	15,000*	10,500	7,474
CROLOY 18-8 Ti (Type 321)	Cr 17.00-20.00; Ni 9.00-13.00; Ti 5xC-.60	A	1050	42,000	34,000	26,500	16,944
		B	1050	40,000	31,000	24,000	8,063
		S	1050	39,500	30,500	23,500	7,119
		A	1200	23,500	16,000	11,000	13,507
		B	1200	24,000	16,000	11,000	9,935
CROLOY 18-8 Cb (Type 348)	Cr 17.00-20.00; Ni 9.00-13.00; Cb 10xC-1.00	A	1050	42,000	34,000	27,500	18,286
		B	1050	45,000	31,000	22,000	9,287
		A	1200	26,500	17,000	10,000	8,495
		B	1200	24,500	16,000	10,000	10,286
		S	1200	24,000	13,500	7,800	17,084
CROLOY 16-13-3 (Type 316)	Cr 16.00-18.00; Ni 11.00-14.00; Mo 2.00-3.00	B	1350	11,500	7,500	4,800	13,848
		S	1350	12,000	6,850	3,650	9,134
		B	1500	6,000	3,300	1,750	13,146
		S	1500	5,850	3,300	1,850	14,233
CROLOY 25-20 (Type 310)	Cr 24.00-26.00; Ni 19.00-22.00	A-1	1350	9,600	4,350	3,400	46,000**
		A-1	1500	4,800	2,500	1,000	6,310
		A-1	1650	2,650	1,000	240	10,083
		A-1	1800	1,375	500	180	10,080

NOTE: All tests from which these data were derived were held 24 hours at test temperature before applying stress.

Heat Treatment
A 2000 F for ½ hour then water quench
A-1 1950 F for 1 hour then water quench
B 2000 F for ½ hour, water quench, then 1750 F for 1 hour then air cool
S 2000 F for ½ hour, water quench, then 1600 F for 5 hours then furnace cool

* Extrapolated.
** Tests have reached time indicated without rupture and are being continued.

Selecting the right tubing for high temperature service calls for consideration of temperature and pressure conditions, combined with a number of other specifics.

Mechanical strength may be the factor of first importance after operating temperature. In this case, the tensile strength of the tubing selected is most important. Though the mechanical strength of some steels decreases as temperatures rise, there are those that retain more of their strength at high temperatures. A case in point is the tensile strength of carbon steel tubing and B&W Croloy 18-8S (Type 304) at 300 F. Both have a tensile strength of about 70,000 psi. at this temperature. However, when the temperature is elevated to 1200 F, the tensile strength of carbon steel tubing is sharply reduced to about 12,000 psi. while Croloy 18-8S decreases to about 44,000 psi.

To evaluate the characteristics of metals operating under stress at high temperatures and over long periods of time, B&W has performed stress rupture tests and creep tests on a great number of alloy and stainless steels. The results of these tests help engineers to determine the proper tube to be used in specific applications. (See tables shown)

Other factors beside mechanical strength, however, must be considered in choosing the optimum tube for a specific high temperature application. Some of these factors are: oxidation resistance, size, cost, flow rates, and rates of conductivity and expansion.

It takes an expert to specify the right tube for any particular application, and there is no substitute for the kind of expert attention to these problems you'll find at B&W.

To get the most benefit from B&W's long experience in matching tubes to jobs, call on Mr. Tubes, your nearby B&W Tube Representative. He can help you make the best choice.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa. and Milwaukee, Wis.: Seamless Tubing, Welded Stainless Steel Tubing
Alliance, Ohio: Welded Carbon Steel Tubing
Milwaukee, Wis.: Seamless Welding Fittings

B&W TUBULAR PRODUCTS DIVISION

CREEP STRESS DATA ON B&W CROLOYS
AND OTHER TUBULAR MATERIALS FOR HIGH-TEMPERATURE SERVICE
Creep Stress in lb. per Sq. In. for 1 Per Cent Elongation in 10,000 and 100,000 Hours

MATERIAL	ANALYSIS	800F	900F	1000F	1100F	1200F	1350F	1500F
	1% — 10,000 Hr. (0.1% — 1000 Hr.)							
CARBON STEEL, KILLED	0.10- 0.20% C; 0.25 max. Si	19,500	11,000	7,200	....	....	....	....
CARBON-MOLY, 0.50% MO.	0.10- 0.20% C; 0.45- 0.65% Mo.	33,500	24,500	12,400	....	....	....	....
CROLOY 1¼	1.00- 1.50% Cr; 0.45- 0.65% Mo.	....	35,000	14,700	5,500	3,375	....	....
CROLOY 2¼	2.00- 2.50% Cr; 0.90- 1.10% Mo.	....	40,500	16,350	9,200	4,175	....	....
CROLOY 5	4.00- 6.00% Cr; 0.45- 0.65% Mo.	....	17,900	9,200	4,800	1,800	....	....
CROLOY 7	6.00- 8.00% Cr; 0.45- 0.65% Mo.	....	14,500	8,000	4,400	2,000	....	....
CROLOY 9M	8.00-10.00% Cr; 0.90- 1.10% Mo.	....	33,250	12,000	6,950	2,300	....	....
CROLOY 18-8S (Type 304)	18.00-20.00% Cr; 8.00-11.00% Ni	....	24,000	18,300	11,550	6,600	2,500	....
CROLOY 16-13-3 (Type 316)	16.00-18.00% Cr; 11.00-14.00% Ni; 2.00-3.00 Mo.	....	....	22,800	13,800	8,200	4,200	1,840
CROLOY 25-20 (Type 310)	24.00-26.00% Cr; 19.00-22.00% Ni	....	....	....	....	7,400	3,300	1,100
	1% — 100,000 Hr. (0.01% — 1000 Hr.)							
CARBON STEEL, KILLED	0.10- 0.20% C; 0.25 max. Si	13,500	8,400	2,150	....	....	....	....
CARBON-MOLY, 0.50% MO.	0.10- 0.20% C; 0.45- 0.65% Mo.	23,500	17,200	5,200	....	....	....	....
CROLOY 1¼	1.00- 1.50% Cr; 0.45- 0.65% Mo.	....	20,000	8,200	2,125	910	....	....
CROLOY 2¼	2.00- 2.50% Cr; 0.90- 1.10% Mo.	....	22,000	7,600	4,910	2,510	....	....
CROLOY 5	4.00- 6.00% Cr; 0.45- 0.65% Mo.	....	15,000	7,200	2,400	900	....	....
CROLOY 7	6.00- 8.00% Cr; 0.45- 0.65% Mo.	....	9,200	5,000	2,500	1,300	....	....
CROLOY 9M	8.00-10.00% Cr; 0.90- 1.10% Mo.	....	24,750	8,500	3,775	1,600	....	....
CROLOY 18-8S (Type 304)	18.00-20.00% Cr; 8.00-11.00% Ni	25,300	18,000	11,500	7,100	4,250	1,600	....
CROLOY 16-13-3 (Type 316)	16.00-18.00% Cr; 11.00-14.00% Ni; 2.00-3.00 Mo.	....	....	14,800	8,700	5,000	2,500	930
CROLOY 25-20 (Type 310)	24.00-26.00% Cr; 19.00-22.00% Ni	....	....	....	....	5,400	2,800	800

Values for Croloys 1¼ to 9M inclusive are for 0.15% carbon maximum alloys.

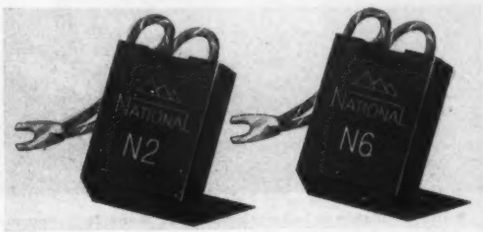
TA—5040 (P)

When inquiring check CP 1493 opposite last page

Totally-enclosed motors with silicone insulation now possible . . .

carbon brushes resist silicone vapors formed in high-temperature operation

Carbon brushes are designed specifically for silicon-insulated, electrical machines operating at high temperatures which must be dissipated by radiation. They resist action of silicone vapors released from motor windings by high temperatures in totally-enclosed DC motors and generators. Vapors caused previous brushes to dust away, rapidly shortening service life. In addition, dust collected in windings and lowered insulating values.



Carbon brushes are applicable to a wide range of commutating requirements

Brushes have been successfully applied to a wide range of commutating requirements in totally-enclosed, general-purpose motors and generators having silicone insulation.

(Carbon brushes N-2 and N-6 are products of National Carbon Co., Div. of Union Carbide and Carbon Corp., Dept. CP, 30 East 42nd St., New York 17, N. Y. . . . or for more information reader may simply check CP 1494 on handy form opposite last page.)

O-rings not always round — can be made with straight sides . . .

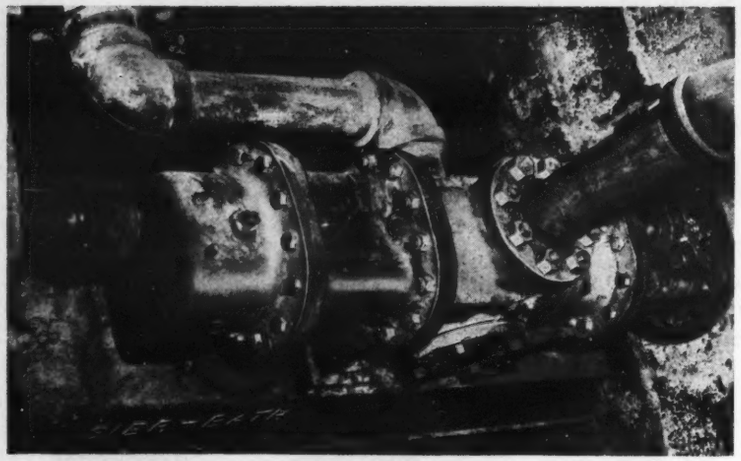
square or triangular shapes are available on special order

O-rings are not always round. They can be made with straight sides of varying lengths with selective radii at the corners. Triangular or other shapes can be made as well. Typical example, one of square O-rings made on special order is one in which material was 321 stainless steel tubing, 3/16" cross section, and .020" wall thickness.

(For further information on square O-rings contact United Metallic O-Ring Dept., United Aircraft Products, Inc., Dept. CP, Box 1035, Dayton 1, Ohio . . . or for more information check CP 1495 on handy form opposite last page.)

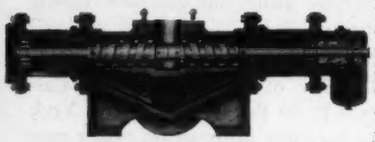
Sier-Bath SCREW PUMP

handling rubber adhesive with VISCOSITY OF 1,500,000 SSU!



● This installation at Technical Tape Corp., Bronx, N. Y., demonstrates the extreme range and heavy duty service of Sier-Bath Screw Pumps. The pump discharges 2 gpm. against 100 psi and has operated satisfactorily for over 4 years. Pump is an external gear and bearing bracket type, coupled to 5 hp., 90 rpm. motor.

Sier-Bath SCREW PUMPS



External Gear and Bearing Bracket Type for non-lubricating liquids and semi-liquids

Internal Gear and Bearing Type for lubricating liquids and semi-liquids

Sier-Bath Screw Pumps maintain high volumetric efficiency because "Dual-Controlled" precision rotor design prevents rotor-to-rotor or rotor-to-casing contact—provides a continuous flow without pulsation, hammering or vibration . . . without strains, misalignment and wear on rotors, shafts, bearings and gears.

Result: Dependable, uninterrupted pumping service—less downtime—less maintenance—easier servicing—longer pump life—lower overall pumping costs.

Capacities from 1 to 1,000 gpm.; viscosities from 32 SSU to 1,000,000 SSU.; discharge to 1,000 psi. for viscous liquids, 200 psi. for water and light oils. Horizontal or vertical construction. Corrosion resistant alloys, special bodies, stuffing boxes and bearings for special needs. Call your Sier-Bath representative or write Sier-Bath Gear & Pump Co., Inc., 9260 Hudson Blvd., North Bergen, N. J.

Sier-Bath ROTARY PUMPS

Screw Pumps | Gearex® Pumps | Hydrex® Pumps

50th Anniversary | Mfrs. of Precision Gears, Rotary Pumps, Flexible Gear Couplings | Member A.G.M.A.

When inquiring check CP 1496 opposite last page

Hose storage space reduced in dual service . . .

reel saves times in handling two liquids or a liquid and a gas

Uses: Fueling or other processes that require delivery of two types of liquid or a liquid and a gas.

Features: Reel eliminates the need for two separate reels for hose storage. It permits hoses to be played out and rewound as one.

Description: Reel is available for hoses up to 1½" ID. Both hoses are connected to their sources and ready for use. Reel has rolled edge discs at either end to guard against chaffing and scuffing. Rewind is accomplished with an explosion-proof electric motor, compressed air motor or hand crank.

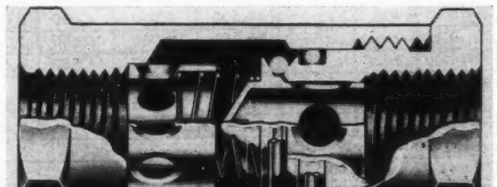
(Hannay Dual Hose Reel is a product of Clifford B. Hannay and Son Inc., Dept. CP, 601 Main Street, Westerlo, N. Y. . . . or for more information check CP 1497 on handy form opposite last page.)

Gives chatter-free operation and dead-tight sealing to 3000 psi . . .

heavier-construction check valve has cracking pressure of 0.5 to 1.0 psi

Uses: Control of flow in high-pressure pneumatic or hydraulic circuits as well as vacuum and low-pressure gas systems.

Features: Seal design which utilizes a resilient O-ring as sealing member gives dead-tight sealing and chatter-free operation. Seal placement and heavy construction permits operation to 3000 psi.



O-ring seal gives chatter-free operation and dead-tight seal

Description: Valve design limits cracking pressure to 0.5 to 1.0 psi, gives low pressure drop, and leak-free reseating. Bodies of brass, aluminum, steel, and stainless steel are available. Sizes range from ⅛ to 2" pipe size.

(Series 200-I check valves are a product of James-Pond-Clark, Dept. CP, 2181 East Foothill Blvd., Pasadena 8, Calif. . . . or for more information check CP 1498 on handy form opposite last page.)

Slo-Speeds Improve Paint Quality

Vertical, face mounted Slo-Speeds on our 300-gallon paint mixing vats have improved product quality, reduced production costs and decreased maintenance. Slo-Speeds require less space, provide greater safety, permit lower cost installation, and give us the exact low speed for our requirements in a single, compact, quiet, rugged unit, reports J. E. Gauntt, of Stebbins & Roberts, Inc., Little Rock, Ark.

STERLING SLO-SPEED

GIVES YOU THE ONE BEST LOW SPEED AND

gives uninterrupted service — carries heavy overhung loads — provides versatile mounting and flexibility in arrangement of machinery — saves valuable space — provides greater safety — costs less to install and use. An indispensable source of low speed power for:

Agitators	Dryers	Presses
Blenders	Feeders	Pumps
Blowers	Kilns	Screens
Conveyors	Mills	Tumblers
Cookers	Mixers	Etc., etc.

20-page illustrated catalog . . . Sterling Speed-Trol, Slo-Speed, Klosd and Klosd-Tite Electric Power Drives. Write for catalog No. 204.

STERLING ELECTRIC MOTORS

Plants: New York City 51; Chicago 35; Los Angeles 22; Hamilton, Canada; Santiago, Chile; Offices and Distributors in all principal cities

When inquiring check CP 1499 opposite last page

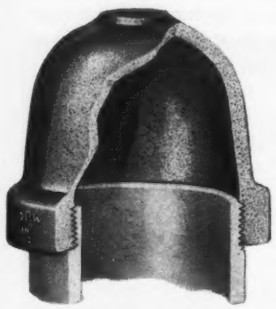
Powdered bronze tank vent allows upward venting of volatile liquids . . .

restricts moisture and foreign material from entering tank through vent line

Uses: Venting volatile liquid storage tanks.

Features: Vapors are projected upward through cells of compressed bronze. Upward movement eliminates hazards of fire and explosion possible with down-vented volatile liquid vapors.

Description: Powdered bronze, formed under temperature and pressure, has honeycomb of venting area which allows full passage of vapor over entire surface of vent. Material resists corrosion and is self cleaning through normal venting action. Porous bronze is impervious to water and restricts moisture and foreign material from entering tank through vent line. Vent is supplied in 2" size and can be adapted to smaller vent lines.



Powdered bronze honeycombed construction allows full passage of vapor over entire surface area

(No. 13 porous tank vent is a product of OPW Corp., Dept. CP, 2735 Colerain Ave., Cincinnati, Ohio . . . or for more information reader may simply check CP 1500 on the convenient Reader Service slip which is located opposite last page.)

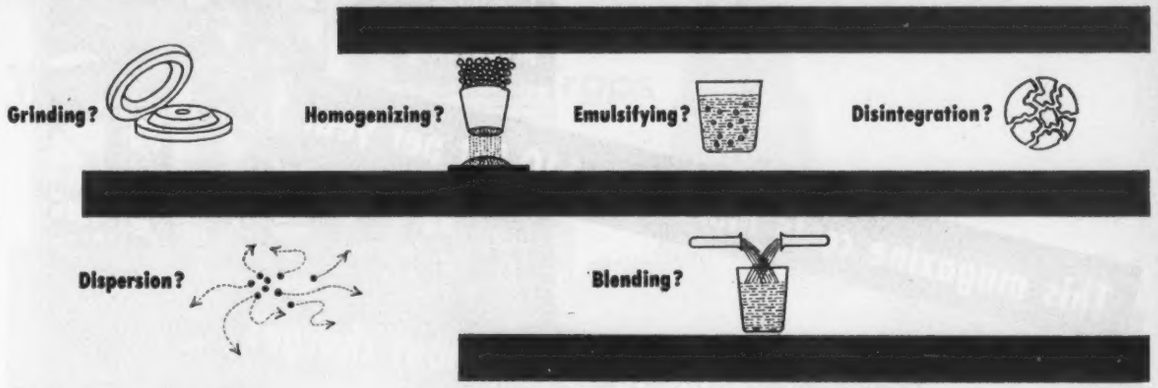
Lubrication of tight fitting parts or force fits, metal to metal . . .

lubricant is non-tacky, non-corrosive, insoluble in water, oil, solvents

Finely powdered lubricant gives efficient lubrication of metal-to-metal parts which are very tight fitting or where force fits are needed. Screws threaded in metal can be lubricated by dusting or dipping before insertion. Small amount held on surface of metal gives desired lubrication. High melting point synthetic wax lubricant is non-tacky, non-corrosive, insoluble in oil, water, and solvents. Wax has good dielectric properties and a melting point of 285°F.

(Acrawax C Atomized lubricant is a product of Glyco Products Co., Inc., Dept. CP, Empire State Building, New York 1, N.Y. . . . or for more information about this product reader may simply check CP 1501 on handy form which is located opposite last page.)

Do you have one of these problems?

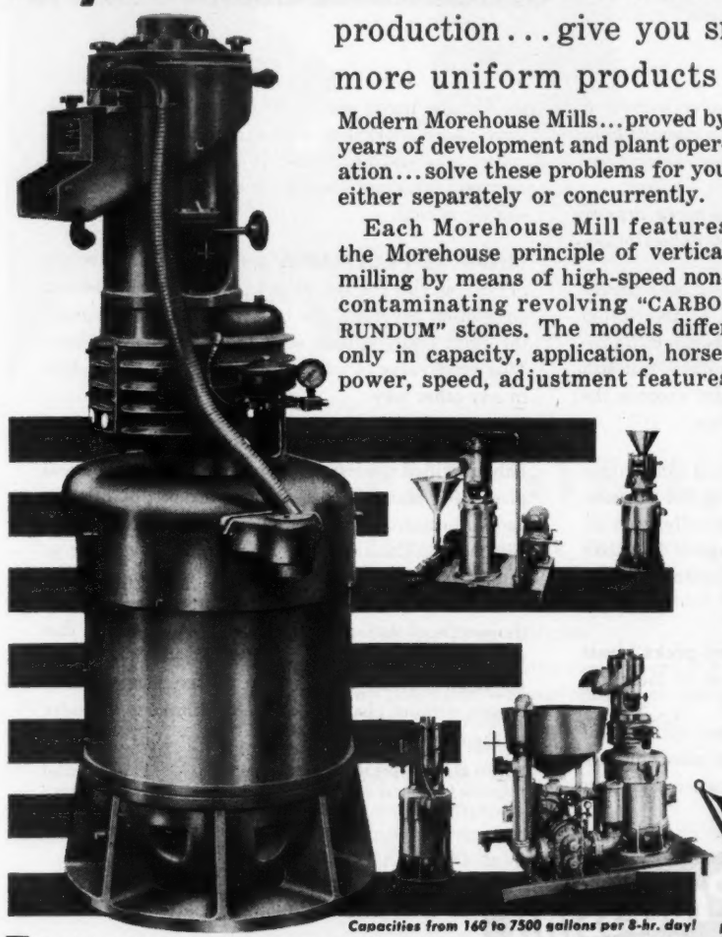


If you do... Morehouse Mills will increase your production... give you smoother, finer, more uniform products... at less cost

Modern Morehouse Mills... proved by years of development and plant operation... solve these problems for you either separately or concurrently.

Each Morehouse Mill features the Morehouse principle of vertical milling by means of high-speed non-contaminating revolving "CARBORUNDUM" stones. The models differ only in capacity, application, horsepower, speed, adjustment features and auxiliary equipment. But these differences are the things that permit a specific Morehouse Mill to solve your specific processing problem.

Used today to process over 100 products in more than 50 countries. Regardless of the frequency, voltage or phase of the electrical current in the area where you operate, there is a Morehouse Mill to meet your needs.



Capacities from 160 to 7500 gallons per 8-hr. day!

And... for ultimate dispersion

The high-speed Cowles Dissolver is 2 to 20 times faster than conventional mixers!

Saves space, labor and maintenance costs. Versatile. Engineered to meet your exact requirements. Fully guaranteed. Many models.

MOREHOUSE COWLES

write or send coupon today!

Originators of high-speed stone milling equipment and sole manufacturers of Morehouse Mills Since 1898

Morehouse-Cowles, Inc., 1150 San Fernando Rd., Los Angeles 65, Calif., Cable Address: "MORESPEED," Los Angeles

Please send complete information on ☐ Morehouse Mills; ☐ Cowles Dissolvers.

I manufacture _____

Name _____

Company Name _____

Address _____

City _____ Country _____

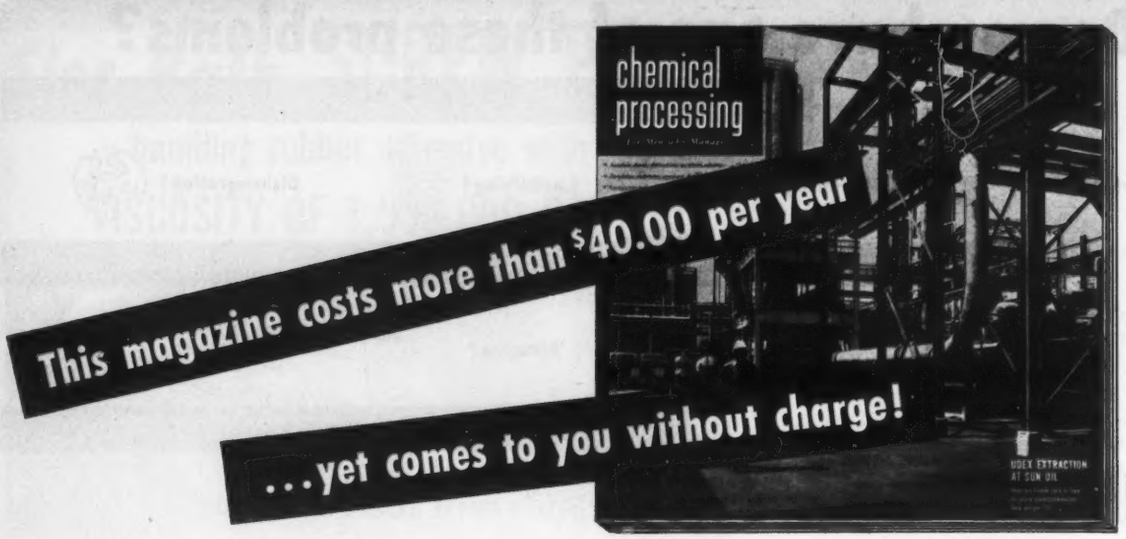
Attencao! Temos util literatura em uma variedade de linguas. Escreve-nos em a sua lingua.

Purchase of Morehouse Equipment is being approved by many governments because of their contributions to the economy of the country

COMPACT AND LIGHTWEIGHT MOREHOUSE MILLS PROCESS FLOWABLE PRODUCTS SUCH AS: Paints • Foods • Chemicals • Greases • Ceramics • Inks • Pharmaceuticals *(corrosive or non-corrosive)*

OFFERING YOU... Low first cost • Desired adjustment without stopping • Easy duplication of desired end-product • No contamination • Easy cleaning and low-cost maintenance

When inquiring check CP 1502 opposite last page



Why? Maybe, like many others, you've wondered why CHEMICAL PROCESSING comes to you *without charge* — while, perhaps, you pay a subscription price for other business magazines.

Maybe you've thought publishers *make money* when they sell you a $3.00 or a $5.00 subscription.

No—publishers lose money . . . yes, most business magazines lose money when they sell a subscription — not only because the magazine costs more to produce than the subscription price brings in — but also because the cost of making such sales exceeds the income for $3.00 or $5.00 subscriptions.

Advertisers pay the bills — You see, it's the money that comes from advertising that keeps the business magazine publisher in business. So, logically, such advertisers *demand* best possible coverage of folks like you—the important key men who exercise buying power.

So—CHEMICAL PROCESSING "hand-picks" best readers . . . and sends the magazine to these key folks, without charge.

For you simply can't get maximum coverage of these important folks by trying to sell subscriptions. These men, limited in numbers, are scattered all over the U.S.A.: travel and/or direct mail cost money; a large share "forget to renew" each year; and, no matter how much time, money and pressure you put on them, there are always some important men who will never buy.

CHEMICAL PROCESSING gets best circulation . . . So, as you can see, to get the best, most effective circulation coverage, the best way is to "hand-pick" the right readers, then send the magazine to them. This gives value to advertisers which can't be gotten in any other way.

That's why . . . CHEMICAL PROCESSING "hand-picks" only qualified readers . . . Men Who Manage chemical processing plants . . . presidents, partners, plant managers, foremen, engineers, chemists, directors of research, etc. Then the editors make the magazine so interesting, so valuable, these folks want to read it.*

That's why CHEMICAL PROCESSING spends many thousands of dollars on each issue — to give you this valuable service costing more than $40.00 per year, per reader. That's why CHEMICAL PROCESSING comes to you without charge—*you are an important reader in the chemical field.*

**Every issue proves this qualified readership . . . by unequalled response from these key readers. May we show you the evidence?*

Chemical Processing

published by Putman Publishing Company

also publishers of:
FOOD PROCESSING
FOOD BUSINESS
"Executive Magazines for Industry"

Condensed vapor problems eliminated by vented vacuum pump

Made possible by addition of air to exhaust

Uses: For vacuum pump applications to overcome problems due to water vapor, solvent vapors, excessive oil changes.

Features: A valving arrangement is provided which permits atmospheric air to enter exhaust cycle of pump. Due to addition of this extra volume of air, vapors coming from system need be compressed only slightly to force the exhaust valve open. Thus, since vapors are not compressed to critical point, they do not condense but pass instead, in vapor form, right out of pump. Even if some condensible material, such as water, should get into oil in liquid form, vented exhaust will clear oil in a matter of minutes.

Air admitted through exhaust vent of pump cannot return to system

Description: Vented exhaust pump has provision for adjusting amount of air introduced to meet various conditions of temperature and vapor concentration. Design is such that air admitted through exhaust vent cannot return to system, so ultimate vacuum attainable approaches that of the same pump with exhaust vent closed.

Free-air capacity of pump is 140 liters/min (5 cu ft). Vacuum with vented exhaust closed is 0.1 micron; with vented exhaust open, 1 micron.

(Vented exhaust vacuum pump is a product of W. M. Welch Scientific Company, a division of W. M. Welch Mfg. Co., Dept. CP, 1515 Sedgwick Street, Chicago 10, Ill. . . . or for more information check CP 1503 on handy form opposite last page.)

Short circuit hazard reduced, cable installation easier . . .

reinforced plastic cable clamps resist abrasion, heat, and shock

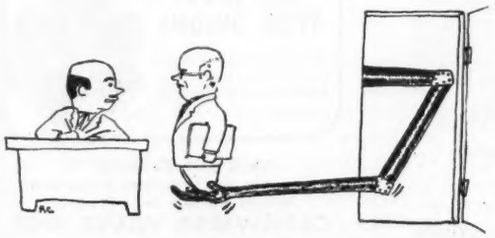
Uses: Holding electrical cable or similar items used in petroleum and chemical industries. Suitable for applications where vibration and shock are important factors.

Features: Reinforced plastic cable clamps will not promote electrical contact, reducing danger of short circuit and fire. No additional lining or insulation is required which simplifies installation.

Thermosetting resin-glass fiber combination clamps resist heat, vibration, and shock

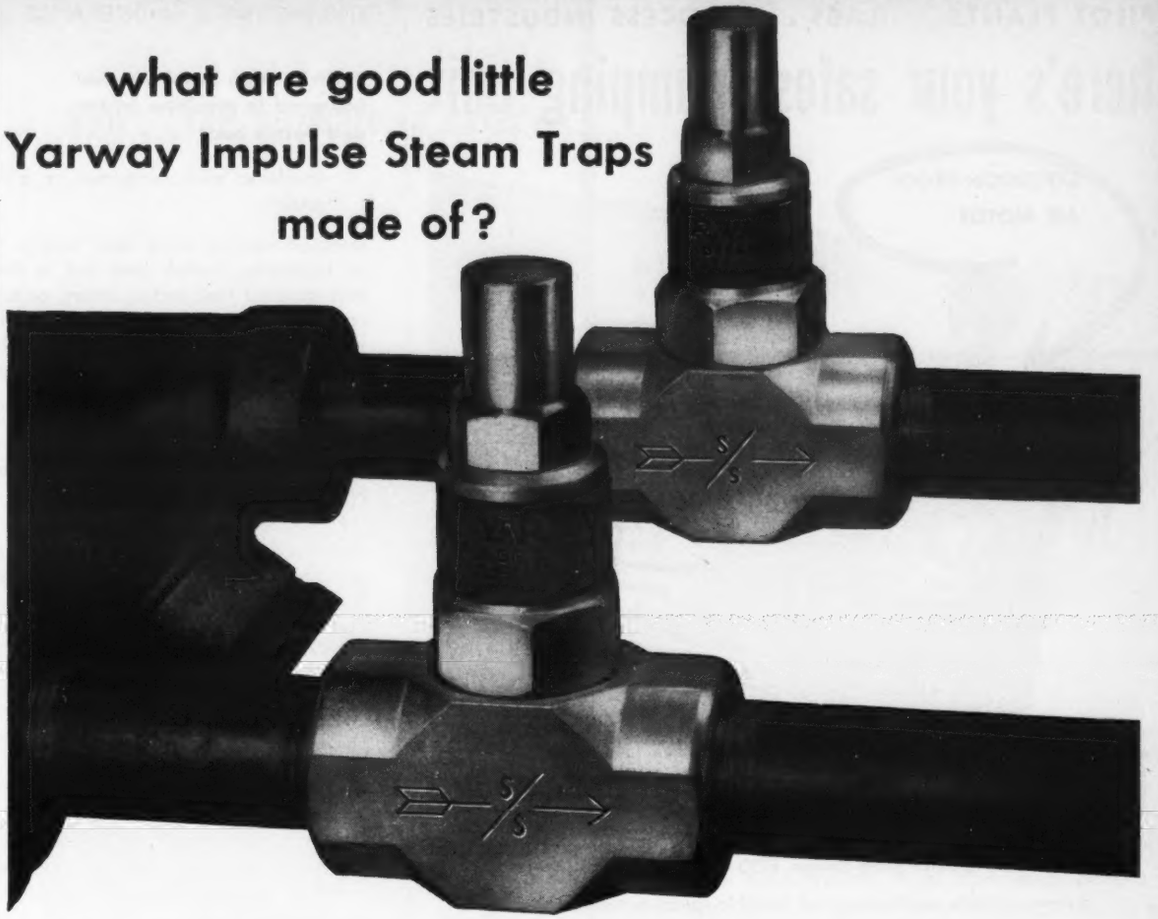
Description: Combination of thermosetting resins and glass fibers will not melt. Clamps are strong, non-corrosive, fire resistant, and provide excellent insulation. They are available in size numbers from 2 through 32 and in cable diameters from 1/8" through 2".

(Reinforced plastic cable clamps are a product of Lunn Laminates, Inc., Dept. CP, Oakwood Rd. and W. 11th St., Huntington Station, N. Y. . . . or for more information check CP 1504 on handy form opposite last page.)



"Okay, I give. What has research and development dreamed up?"

what are good little Yarway Impulse Steam Traps made of?



STAINLESS STEEL, *of course*

Body and all internal parts of YARWAY Impulse Steam Traps are of *stainless steel*—one of the biggest steps taken by any trap manufacturer to increase trap life and reduce maintenance.

Other YARWAY Impulse Steam Trap features:

- **Gets equipment hot in a hurry—and keeps it hot.**
- **Good for all pressures without change of valve or seat.**
- **Easy installation—small size, light weight.**
- **Non-freezing at low temperatures.**
- **Six standard sizes, ½" to 2".**

Want *proof* of performance? Try a YARWAY Impulse Trap and Fine Screen Strainer FREE for 90 days in your own plant. For free trial or free Trap Selector, write . . .

YARNALL-WARING COMPANY
125 Mermaid Ave., Philadelphia 18, Pa.

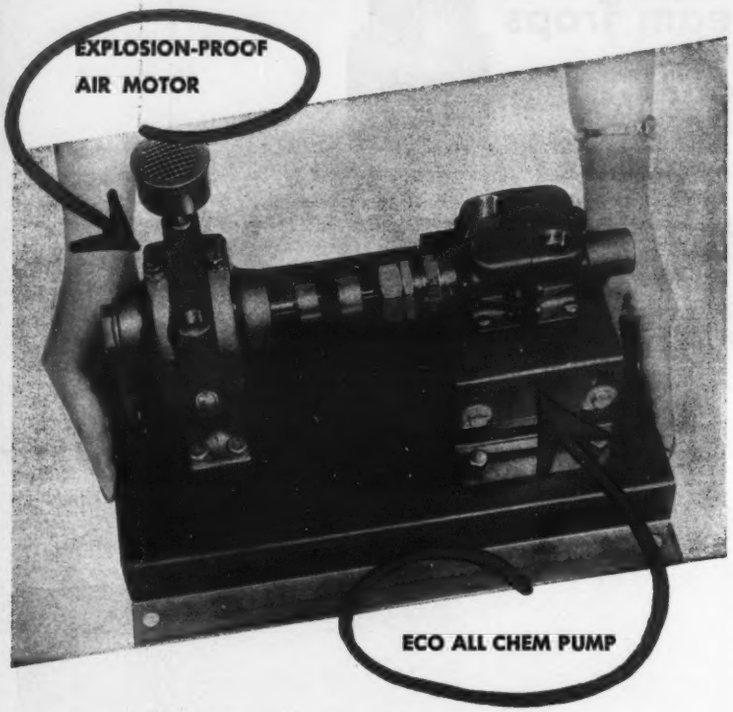
OVER 1,000,000 YARWAY IMPULSE TRAPS SOLD—STOCKED BY 270 CONVENIENT INDUSTRIAL DISTRIBUTORS

YARWAY
impulse steam trap

When inquiring check CP 1505 opposite last page

PILOT PLANTS . . . LABS . . . PROCESS INDUSTRIES

here's your safest pumping unit



The leaders in small pump design, ECO ENGINEERING now offers a new, portable explosion-proof variable speed pumping unit. This compact unit combines the time-tested ECO All Chem Pump with a manually controlled variable speed air motor. It's the safest combination for handling hazardous or corrosive fluids and was designed for labs, pilot plants, chemical process plants, pharmaceutical and nuclear installations. The ECO All Chem Pump is self-priming with non-volatile fluids and is readily available in a variety of construction materials suitable for dependable, low-cost pumping of non-abrasive fluids. ECO can make immediate shipment of the complete unit in capacities from 0 to 10 GPM and pressure to 100 PSIG.

CALL OR WRITE US TODAY!

All-Chem PUMPS *the big name in small pumps*

ECO

ENGINEERING COMPANY

12 NEW YORK AVE., NEWARK, N. J.

When inquiring check CP 1506 opposite last page

Built-in, high-pressure seal featured in machine screw and switch boot . . .

available with neoprene or silicone rubber gasket

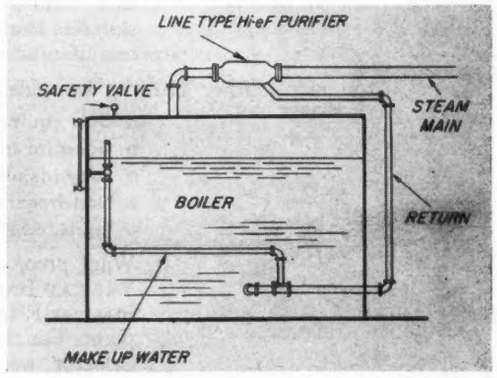
Standard machine screw with built-in O-ring, seals on tightening. Switch boot seal is designed to fit over standard push-button, rotary, or toggle switches replacing usual panel locknut. Integral gasket rib seats against panel surface to achieve sealing. Both devices protect against entry of dust, moisture, or combustible vapors. For general purpose use silicone rubber seal can be operated at temperatures from −110 to 500°F. Where resistance to attack by petroleum or petrochemicals is needed neoprene units are recommended. Temperature range on neoprene is −60 to 200°F.

(Seelskrews and Hexseals are products of Automatic and Precision Mfg. Co., Dept. CP, 252 Hawthorne Ave., Yonkers, N. Y. . . . or for more information check CP 1507 on handy form opposite last page.)

Eliminates boiler shutdowns — and costly servicing due to foreign matter . . .

purifying system prevents excessive fluctuation of water level and reduces power loss

Installation of a purifier as header in low pressure boiler systems has eliminated shutdowns caused by boiler priming due to accumulation of foreign matter in about 25 installations made in the Salt Lake City, Utah area. Priming, which discharges



Installation of purifier in low pressure boiler system

large quantities of water into the steam system, recirculated the objectionable foreign matter, caused a loss of fuel and excessive fluctuation of water level. Purifier intercepts virtually 100% of water and entrainment leaving the boiler, keeping it out of heating system.

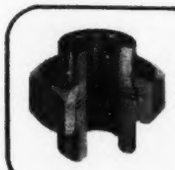
Catawissa PERFECT SEAL Unions

HOT FORGED from solid, rectangular steel bars, designed and produced for dependable, long-life service under the severest piping conditions!

A TYPE FOR EVERY USE!
FOR ALL PRESSURES!
FOR ALL TEMPERATURES!

Standard & Double Extra Heavy UNIONS

Available with screwed or socket weld ends. 3000-lb. sizes ⅛" to 3"; 6000-lb. sizes ⅛" to 2".



ORIFICE UNIONS

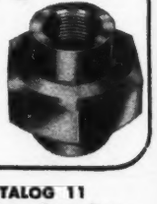
With screwed or socket weld ends. 3000-lb. and 6000-lb. service.

MALE & FEMALE UNIONS

With steel-to-steel, bronze-to-steel, stainless steel-to-steel or orifice seats. 3000-lb. service only.

FULL STAINLESS & FULL ALLOY STEEL UNIONS

With screwed or socket weld ends. 3000-lb. and 8000-lb. service.



WRITE FOR CATALOG 11
showing the complete Catawissa line of Perfect Seal Products

CATAWISSA VALVE AND FITTINGS COMPANY

620 Mill St. • CATAWISSA, PA.

When inquiring check CP 1508 opposite last page

Purifier, which employs a principle of controlled centrifugal force, has no moving parts or filters. Water and entrainment separated by purifier are returned to boiler and can be taken out during blowdowns. Device operates without attention on the part of operator.

(Boiler systems were installed by A. A. Maycock Co., Dept. CP, 234 Seventh Ave., Salt Lake City, Utah . . . or for more information check CP 1509 on handy form opposite last page.)

(Hi-eF Line Type Purifier is a product of V. D. Anderson Co., sub. of Chesapeake Industries, Dept. CP, 1935 W. 96th St., Cleveland 2, Ohio . . . or check CP 1509A opposite last page.)

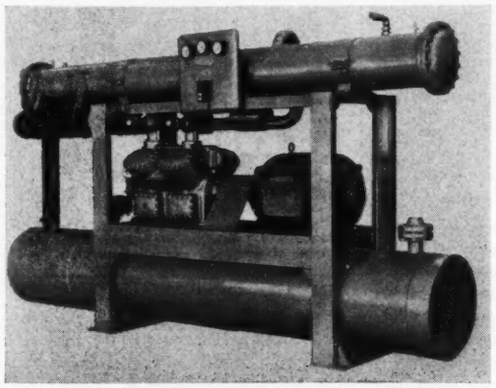
Compact water cooling machine particularly good where space is critical . . .

water and electrical connections make unit ready for service

Uses: Air conditioning and process refrigeration installations ranging in size from 5 to 125 hp.

Features: Particularly suitable for use where space is critical, will pass through doorway.

Description: All components of refrigerating system, compressor, condenser, and cooler, come



Compact refrigerating unit will pass through average size doorwey

as a single unit. It is efficiently piped, filled with oil, and a holding charge of refrigerant. Mounted in a structural steel frame, unit is ready for service after a few water and electrical connections. Models are available from 25 to 75 hp for handling applications for chilled water under 100 tons capacity.

(Packaged refrigerating system is a product of Carrier Corp., Dept. CP, 300 Geddes St., Syracuse, New York . . . or for more information check CP 1510 on handy form opposite last page.)

Now . . the ultimate in safety!

the NEW . .

(Pat. Pending)

Glas-Col CO_2-Purged Heating Mantle

Flashing of flammable vapors is practically impossible with this new Glas-Col CO_2-Purged Heating Mantle.

Here's how it works: At the bottom of the mantle's aluminum housing, there is an inlet which permits a slow stream of CO_2 gas to pass through the interior of the heating mantle. Thus, the mantle's interior, and more particularly, the heating elements are continuously blanketed with CO_2 gas.

The new Glas-Col CO_2-Purged Heating Mantle represents the most important advance in heating mantle design to date.

Glas-Col CO_2-Purged Heating Mantles are available in a wide range of sizes*, shapes, and types, in standard and custom-made models; in the new super-tough Glas-Col "R" fabric, as well as in glass or quartz fabrics.

Temperatures are controlled up to 650° C . . by means of a variable transformer.

Glas-Col Apparatus Company • Dept. CP, 711 Hulman Street, Terre Haute, Indiana

*Capacities range 1-liter to 72 liters

U. S. Patent No. 2,282,078 — U. S. Patent No. 2,231,506

GLAS-COL

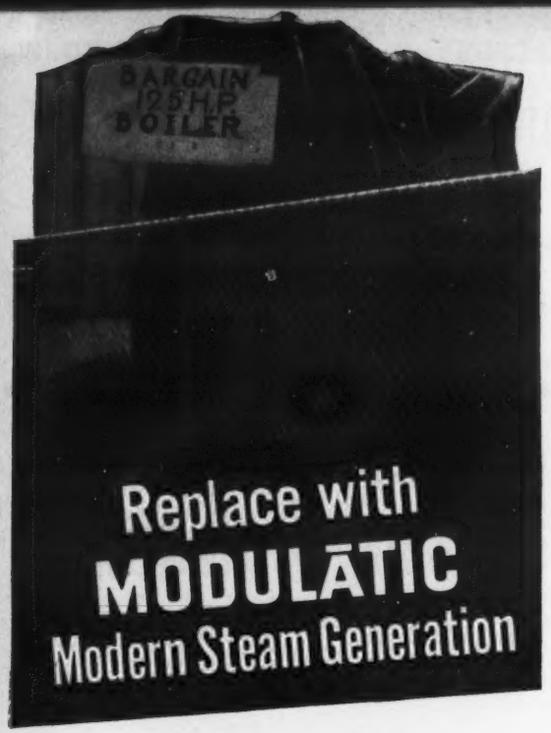
Trademark Registered U. S. Patent Office

ELECTRIC HEATING MANTLES

Specialists in Laboratory and Pilot Plant Heating Problems

For additional information on the new Glas-Col CO_2-Purged Heating Mantle, ask for Bulletin 101.

When inquiring check CP 1511 opposite last page



This sign-of-the-times points to something important—to *new efficiency* in steam generation . . . to new savings in time, in attention—*in money*—users get with new Modulātic.

Big space-savings, too, for Modulātic takes only about *one-fourth* as much room. Put it anywhere—needs no separate enclosure, expensive foundation or stack . . . ships complete, ready to quickly connect and fire up.

SAVES FUEL, WATER

And that's not all! Modulātic makes steam only *when* you need it, only *what* you need—automatically, at the touch of a button. It's unequalled for accurate "tracking" of fluctuating load. Over 10,000 already in use for heating, power, processing.

Sizes, 10 to 160 h.p. Pressures, 5 to 300 psi., and even higher when so ordered. Oil, gas, or flip-switch combination. Single or multiple installation with coordinated control.

Wire Vapor Chicago *collect* today (mention No. 41) for the modern answer to additional steam and complete steam plants backed by 30 years' development in the world's toughest boiler rooms.

VAPOR MODULĀTIC

Ask for Bulletin No. 586

VAPOR HEATING CORPORATION
80 E. Jackson Blvd., Chicago 4, Illinois
In Canada: Vapor Car Heating Co. of Canada, Ltd., 65 Dalhousie St., Montreal 3

When inquiring check CP 1512 opposite last page

Flooring that "gives" won't crack under heavy loads . . .

rubber-concrete combination also deadens noise

An industrial flooring and construction material, which "gives" without cracking under heavy loads, has been developed. Material is a combination of liquid rubber and a special cement powder. It is a surface coating and can be used for repair work or in new installations.

Material comes in two parts — powder and a liquid rubber — and is prepared like regular concrete. Standard masonry equipment is used both to mix and apply it. One of the few requirements in using it is that it must be applied to a clean surface.

(Laticrete concrete-rubber mix for industrial flooring is a product of Naugatuck Chemical Division, United States Rubber Co., Dept. CP, Rockefeller Center, New York 20, N. Y. . . . or for more information check CP 1513 on handy form opposite last page.)

NBS reference tables for thermocouples

National Bureau of Standards has issued expanded reference tables for thermocouples. Tables are based upon absolute electrical units and International Temperature Scale of 1948. Tables are designed to be used for conversion of measured electromotive forces of thermocouples and their equivalent temperatures, testing and calibration of commercial thermocouples, preparation of purchase specifications for thermocouple wire, and precise calibration of instrument scales. This bulletin supercedes Circular 508.

To obtain Circular 561, "Reference Tables for Thermocouples", National Bureau of Standards, issued April 27, 1955, remit 50 cents to Government Printing Office, Washington 25, D. C.

3-WAY VALVES FOR INTERCHANGE OR DIVERSION OF FLOW

This 3-way, twin butterfly valve, controlled by an air operator, is used in the inlet water line of a cooling tower to divert flow to the upper tower reservoir section.

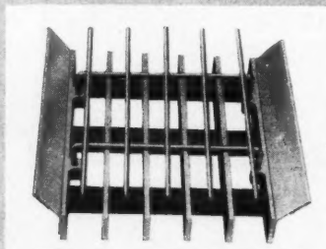
It is one of many Rockwell manual or automatic valve types for handling air, gases, liquids and semi-solids at required operating pressures and temperatures.

Write for Catalog.

W. S. ROCKWELL COMPANY
ROCKWELL SINCE 1888 BUILT
FURNACES • OVENS • BURNERS • VALVES • SPECIAL MACHINERY
2205 ELIOT STREET • FAIRFIELD, CONN.
Sales Representatives in Principal Cities

When inquiring check CP 1514 opposite last page

What dry materials have you to purify?



This is the unique Bauer Magnetic Grate. Bulletin P-3 describes it and our other types of permanent magnetic separators.

You undoubtedly work with dry materials which require separating into various components. If so, you can probably get some interesting and useful information from us on the subject.

We make three types of separating equipment.

Specific Gravity Separators. Through a combination of mechanical and pneumatic forces, these machines classify materials according to apparent density.

Mechanical Graders. By means of screens, these machines separate materials according to sizes of pieces or particles. Exhaust systems are often incorporated to remove fines, dust, etc.

Magnetic Separators. These are principally used for the removal of tramp iron. We furnish them in chute, grate, lifting, and pulley types.

If you have a knotty separating problem, we may have the answer. Just give us an idea of the job you want done.

Bauer

THE BAUER BROS. CO.
1728 Sheridan Ave. • Springfield, Ohio

When inquiring check CP 1515 opposite last page

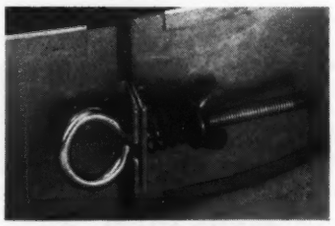
Hand-clamping device makes drum heater easy to use . . .

unit puts out 10,236 Btu at 230v input

Uses: Heating standard 55-gal drums which contain materials requiring warming to expedite flow from container.

Features: Heaters slip over any 55-gal drum and are held in position by a quick, easy, hand-clamping wing-nut device. This makes removal for reapplication to other drums easy, without use of tools.

Description: Unit delivers 3000 watts, or 10,236 Btu at 230 volts input. Three stud terminals, housed in a standard electrical output box, afford connections to provide any one of three heats (750, 1500, or 3000 watts).



Application and removal of heaters is made easy by hand-clamping wing-nut

Wattage concentration throughout face of heaters is kept below points conducive to "coking" or burning contents of drums.

Heaters are 5" wide x size to fit standard 22¼" diam drums. Sheath is aluminized steel, and electrical resistor is nickel chrome, insulated by high-grade mica.

Sizes for small containers and other applications are also available.

(Drum heaters are products of Acra Electric Corporation, Dept. CP, 9901-A Pacific Ave., Franklin Park, Ill. Check CP 1516 opposite last page.)

For more information on product at right, specify CP 1517 . . . see information request blank opposite last page.

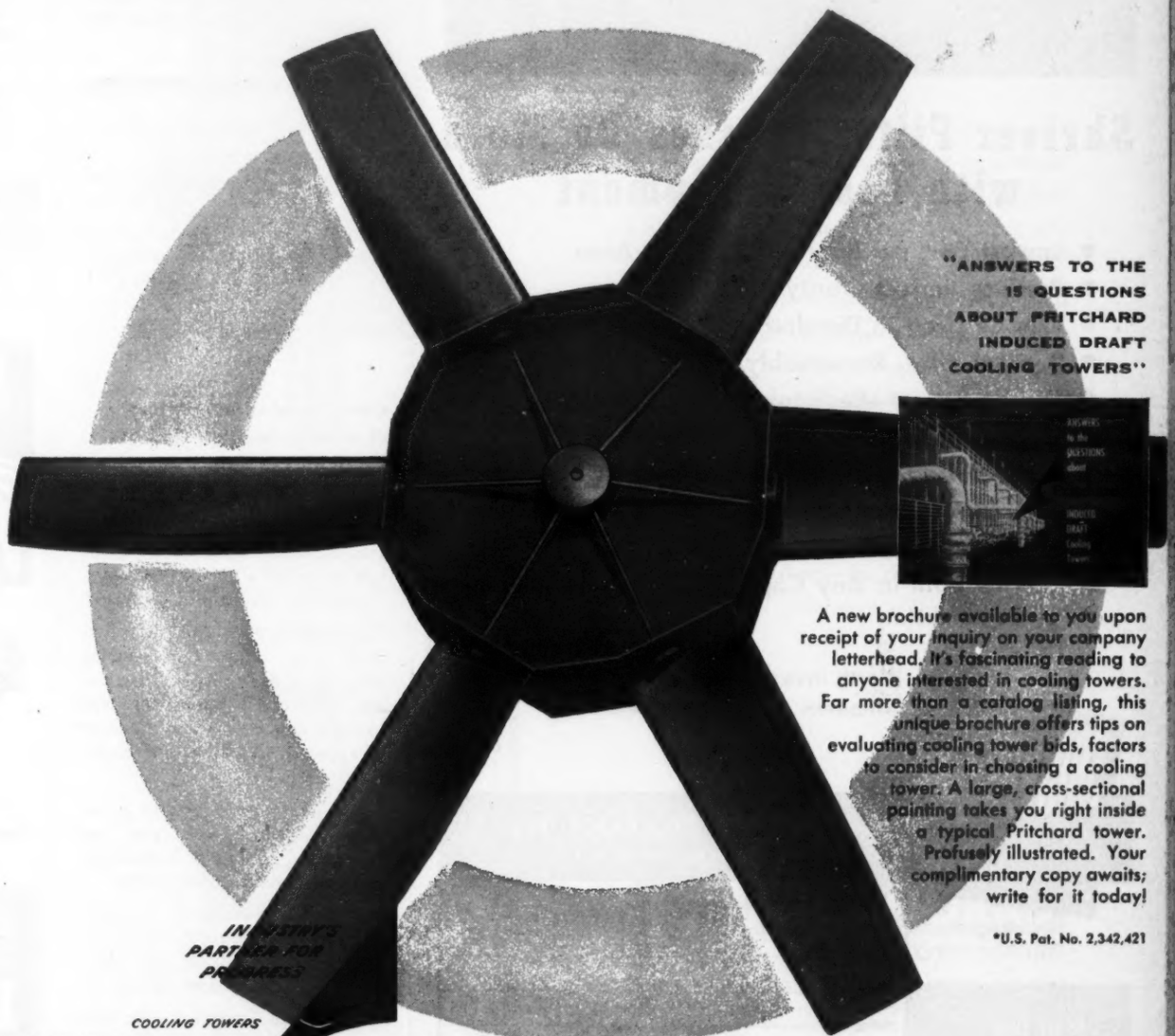
RUGGED *POWairSAVER** FAN DEVELOPS MAXIMUM AIR FLOW ECONOMICALLY

The POWairSAVER fan is exclusive with Pritchard. It was developed specifically for cooling tower service. It develops maximum air flow, economically, because of patented* design and construction.

The blade, of airfoil design, is twisted to pump as much air at the hub as at the tip of the blade. The hub is constructed to allow for no back flow of air near the hub. Thus, you get high aerodynamic efficiency, with low horsepower, on this adjustable pitch, POWairSAVER fan, exclusive with Pritchard!

POWairSAVER blades and hubs are precision-made in jigs for greater uniformity and easy interchange of parts. Monel or stainless steel blades are available to meet specific anti-corrosion requirements.

A six-blade design is pictured. Also available in four and eight-blades. It's exclusive with Pritchard—the POWairSAVER fan—one more reason to choose Pritchard cooling towers!



"ANSWERS TO THE 15 QUESTIONS ABOUT PRITCHARD INDUCED DRAFT COOLING TOWERS"

A new brochure available to you upon receipt of your inquiry on your company letterhead. It's fascinating reading to anyone interested in cooling towers. Far more than a catalog listing, this unique brochure offers tips on evaluating cooling tower bids, factors to consider in choosing a cooling tower. A large, cross-sectional painting takes you right inside a typical Pritchard tower. Profusely illustrated. Your complimentary copy awaits; write for it today!

*U.S. Pat. No. 2,342,421

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COOLING TOWERS
GAS & AIR TREATING EQUIPMENT

REPRESENTATIVES IN PRINCIPAL CITIES FROM COAST TO COAST

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OF CALIFORNIA
A DIVISION OF J. F. PRITCHARD & CO.
Dept. 492, 4625 Roanoke Parkway, Kansas City 12, Mo.

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Shriver Filter Presses Do More with Less Equipment

- Lowest Cost per Sq. Ft. of Filtering Area
- Produce Perfect Clarity of Filtrate
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When inquiring check CP 1518 opposite last page

ENGINEERING

Replace condenser tubes more quickly and easily with tube pilot . . .

attached nylon brush cleans tube rolling area

Uses: Aid in replacing tubes in condensers and heat exchangers.

Features: Steel nose guides tubes through tube sheet and tube support plates.

Description: Hardened steel nose has nylon brush for centering and holding pilot in place. Inserting and removing brush cleans tube

Nylon brush holds pilot in place

where it will be rolled. Pilots are made for tubes 1¼" and smaller.

(Tube pilots are a product of Elliott Co., Dept. CP, 900 N. Fourth St., Jeannette, Pa. . . . check CP 1519 opposite last page.)

Offer simpler installation of needle, toggle, check valves

Line of needle, toggle, and check valves features Swagelok tube ends for simplified installation. Swagelok tube ends are a product of Crawford Fitting Company of Cleveland.

Use of these tube ends on valves does away with pipe-to-tubing adaptors or flaring tools. They permit direct connection of tube end to valve with a turn and a quarter of a wrench, resulting in a torque-free, leak-proof seal.

Improved design of graphic panelboards, instrument air lines, test panels, and pilot plant installations is possible using these valves.

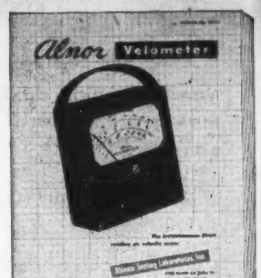
Needle valves are used for throttling and shutoff, toggle valves for quick, positive shutoff, and check valves for reverse flow control.

(Valves with Swagelock tube ends are products of Hoke, Incorporated, Dept. CP, 145 South Dean Street, Englewood, N. J. . . . check CP 1520 opposite last page.)

FREE

ILLUSTRATED BULLETIN

How you can save time by measuring air velocities with an
ALNOR VELOMETER



Developed to facilitate quick and easy determination of air velocities, the Alnor Velometer is a compact, precision instrument that provides instantaneous, direct readings in feet per minute, without timing, calculations or reference to conversion tables. Guaranteed accurate, in ranges from 20 f.p.m. to as high as 24,000 f.p.m. Also available with metric or miles-per-hour calibrations.

Tear out this ad and mail it with your business letterhead to Illinois Testing Laboratories, Inc., Room 504, 420 N. LaSalle St., Chicago 10, Ill.

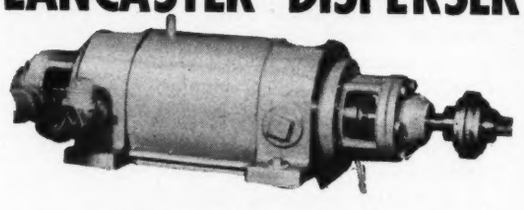
Alnor

PRECISION INSTRUMENTS FOR EVERY INDUSTRY

When inquiring check CP 1521 opposite last page

MIXING PROBLEM?

Solve it Completely with a LANCASTER DISPERSER



. . . a rugged, compact machine for fast, economical, intricate mixing of . . .

• liquids and solids • liquids and liquids • liquids and gases

Ideal for continuous processing . . . handles anything pumpable . . . delivers high through-put . . . allows controllable recirculation . . . cleans easily and quickly . . . requires little maintenance.

Available for 50-5000 gal./hr. (7-7000 lbs./min.)

LANCASTER CHEMICAL CORP.
CARLSTADT, NEW JERSEY
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Write for complete information and brochure. Please state mixing problem, product, viscosity, temperature and corrosion conditions, and present mixing method.

When inquiring check CP 1522 opposite last page

Pipe welding improved with flat ring . . .

enables joints to consistently pass X-ray and Gamma ray inspection

Joints consistently pass X-ray and Gamma ray inspections and meet all safety code requirements with the use of flat type welding ring with 1/8" diameter spacer pins. Welding ring was developed to improve the submerged arc welding of pipe and fittings, but is also suitable for many manual welding applications.

Small spacer pins of welding ring automatically center it in the joint. In this way they positively prevent the ring from shifting up or down stream, even in vertical or steeply sloping lines.

(Flat welding rings are products of Tube Turns, Div. of National Cylinder Gas Co., Dept. CP, 224 E. Broadway, Louisville 1, Kentucky . . . or for more information check CP 1523 opposite last page.)

Multi-purpose room partitioning cost reduced with retractable curtain partition . . .

acoustical absorption aids in noise control

Uses: Partitioning of multi-purpose rooms in office or plant areas where varying space division is required.

Features: Simple design and built-in strength reduce installation and maintenance costs. High density curtain is high grade jute, resin coated for flame protection, and serves as an effective noise barrier.

Description: Curtain is formed into 7" panel folds, chain spaced to produce a voluted effect. It is supported by steel top plates and operates on nylon wheels in an enclosed track.

(BemisWall is a product of Bemis Bro. Bag Co., Dept. CP, 408 Pine Street, St. Louis, Mo. . . . or check CP 1524 opposite last page.)

Discusses development of tinplate manufacturing methods

Production methods and processes for electrolytic and hot-dipped tinplate are given in 27-page reprint of an address presented before 1954 meeting of International Congress on Packaging. Differences in products, latest technical developments, methods for testing tinplate coatings, and tinplate steel specifications are discussed.

"Some Recent Advances in Tinplate Manufacturing Processes" is issued by Tin Research Institute, Inc., Dept. CP, 492 West Sixth Ave., Columbus 1, Ohio. Specify CP 1525 opposite last page.

the ultimate in
VERTICAL SHAFT DRIVES

PHILADELPHIA
MOTOREDUCER

PLANETORQUE is an exclusive feature that can be supplied with any Philadelphia MotoReduceR. By immediate action in breaking the motor circuit, it safeguards both driven machinery and drive unit from dangerous overloads. PLANETORQUE is widely used on stoker drives, conveyor drives, mixers, agitators, roll drives, and tumblers, etc. . . . wherever overloads or jamming may be encountered.

The ultimate in compact, neat and sturdy vertical motoreducers. These reducers have given outstanding performance in thousands of industrial applications requiring a reliable Vertical Drive.

Because of the *unique single casing and bolted-on motor construction*, mounting and installation is simplified through elimination of extra baseplates and couplings. The planetary reduction gears provide an extremely rugged drive capable of withstanding the most severe overload service conditions. Another advantage of the Philadelphia MotoReduceR is its wide bearing span, which permits the use of long unsupported vertical shafts.

So we say: "Examine the construction of these units, and you'll understand why there's nothing like them".

For further information, send for 32 page Catalog #MR-54A.

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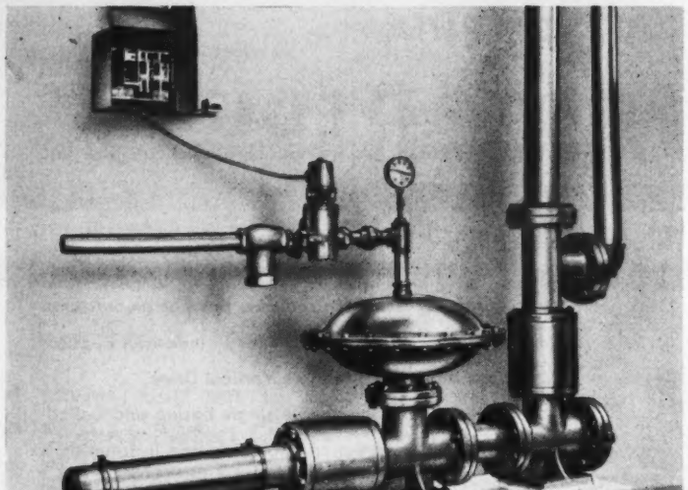
Virginia Gear & Machine Corp., Lynchburg, Va.
Industrial Gears & Speed Reducers • LimiTorque Valve Controls
Established 1892

When inquiring check CP 1526 opposite last page

ODS Diaphragm SLURRY PUMP



link-free simplicity . . . a low maintenance feature!

There's nothing novel about a diaphragm being used to transmit a pumping impulse to a stream of slurry or liquid. Up to that point the ODS Pump is similar to all other diaphragm slurry pumps.

But where the ODS Pump does differ is in the way the diaphragm gets its impulse. In the ODS Pump this is created pneumatically — not mechanically. There is no link connecting the diaphragm with the source of power. There are no bolt holes in the center of the diaphragm.

The ODS Pump has a variable volume controlled by an electric timer which may be located at any distance from the pump convenient to the operator.

This combination of "no mechanical link to the diaphragm" and "no slots or holes in the diaphragm" makes the ODS Pump just about the simplest diaphragm slurry pump you can find anywhere. You can readily appreciate what these two design features mean in the way of low maintenance. Since maintenance is an important factor in pumps, why not get all the details about the ODS Pump? In writing for our Bulletin 309-R, tell us about your pumping problem.

DORR-OLIVER INCORPORATED
WORLD-WIDE RESEARCH · ENGINEERING · EQUIPMENT
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When inquiring check CP 1527 opposite last page

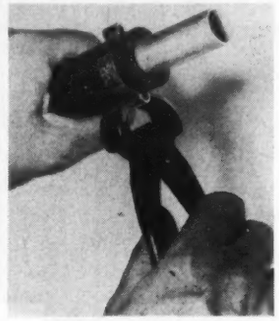
Applied in three seconds, hose clamp assures no slippage . . .

simplified application saves on clamping time and costs

Uses: Joining hose or tubing to nipples or metal extensions.

Features: Lasting and positive clamping action is assured under extreme internal hose pressure, hose movement, and rough usage. Clamp can be applied, using an ordinary pincers, in three seconds.

Description: Device is slipped on hose or part and crimped in place by squeezing parallel sides of lugs together with pincers reducing clamping time and cost. Laboratory hydrostatic pressure tests have shown no slippage or loss of clamping action at hose burst pressures ranging from 12,300 to 12,800 psi. Each clamp is marked with minimum and maximum diameters of hose or tube for which it is applicable. Units are made from various ferrous and non-ferrous metals and are available in 20 sizes ranging from ¼ to 2⅝" ID.



Clamps are marked with minimum and maximum diameters of hose fitted

(Hose clamps are a product of Circle Clamp Corp., Dept. CP, 39 Broadway, New York 6, N. Y. . . . or check CP 1528 opposite last page.)

Effective heat dissipation allows V-belt to operate at room temp of 180°F . . .

resists petroleum derivatives, is impervious to oil and grease

Cog surface in place of conventional covering on heat-resistant V-belt eliminates checking and cracking and allows rapid heat dissipation. Belt operates without loss of effectiveness at room temperatures up to 180°F. Standard belts suffer a loss of life at the rate of one-half to two per cent for each degree of increase above 140°F.

Synthetic rubber composition is impervious to oil and grease. It resists most petroleum derivatives.

(Cog V-belts are supplied by Dayton Rubber Co., Dept. CP, Dayton, Ohio . . . or for more information check CP 1529 opposite last page.)

SERV-RITE

Insulated Thermocouple Wire Extension Lead Wire

FOR

PLATINUM COUPLES
CHROMEL ALUMEL
IRON CONSTANTAN
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IRON CUPRONEL

No matter what your wire or insulation requirements may be, you can depend on Gordon "Serv-Rite" insulated wire for pyrometers—recognized as a standard of highest quality for nearly half a century. All "Serv-Rite" wire is now manufactured in the new, completely modern Gordon plant, employing up-to-date equipment and machinery, supervised and operated by skilled technicians—your guarantee of continued precision quality. In addition to maintaining large stocks of all common types of wire, Gordon will manufacture special insulation, in long or short runs, to suit your individual needs and meet your most rigid specifications.

All Types of Insulation

Felted Asbestos
Asbestos Braid
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Glass Braid
Polyvinyl Plastic
Nylon Braid
Stainless Steel Armored Braid
Silicone Treated
Cotton Braid
Lead Jacket

Ask for Bulletin No. 1200 for Application Data and Complete Specifications on Thermocouple and Extension Wire

GORDON SERVICE 5484

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Thermocouple Supplies • Industrial Furnaces & Ovens
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When inquiring check CP 1530 opposite last page

What's your need for heat?

Whatever your heating job may be, you'll find the efficient, economical answer in . . .

CHROMALOX Electric Heaters

. . . for heating platens, dies, molds, metal parts . . . for heating liquids, air, gases . . . for curing, drying, baking . . . for comfort heating in offices and factories . . . for special applications . . . in fact for any application requiring fast, low-cost, controlled heat up to 1100°F.

IMMEDIATE DELIVERY

from the world's largest factory stock of industrial electric heaters . . . over 15,000 types, sizes and ratings.

Let the Chromalox Sales-Engineering staff solve your heating problems . . . electrically.

Write for your copy of Catalog 50

Contains helpful information on design uses, and prices of Chromalox Electric heaters, elements, thermostats, contactors and switches.

To get some interesting facts about additional applications of electric heat, ask for Booklet F1550—"101 Ways to Apply Electric Heat."

Edwin L. Wiegand Company

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☐ A copy of Catalog 50
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When inquiring check CP 1531 opposite last page

Ease of plumbing and mounting foot-operated air valve aids installation . . .

non-corrosive materials lengthen service life

Uses: Control of shop range air pressures up to 250 psi.

Features: Design of valve makes plumbing and mounting easier. Any port may be used as the pressure port. Valve body can be rotated in 90° increments. Mounting bracket is an integral part of unit.

Description: Materials of construction are non-corrosive. Seals are of brass. The rotor is bronze and shaft is stainless steel. Valve body and housing are aluminum. Valve operates on Shear-Seal principle consisting of a pressure-balanced, self-aligning valve seat in contact with a rotor containing flow passages.

Foot-operated.. air.. valve incorporates Shear-Seal principle

Actuation of valve shears flow and square corner of seat wipes rotor clean. Valves are available in ¼ and ⅜" port sizes.

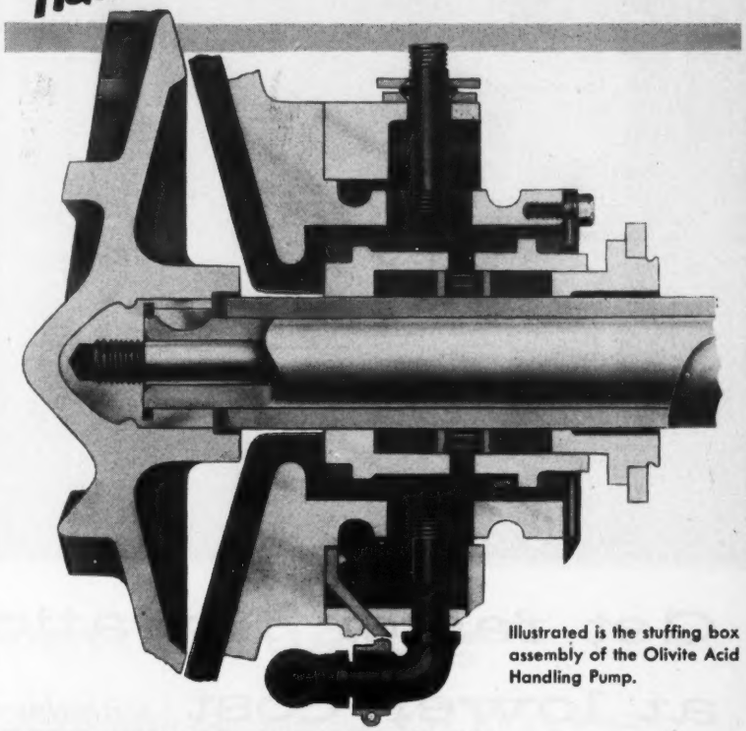
(Shear-Seal valves are a product of Barksdale Valves, Dept. CP, 5125 Alcoa Ave., Los Angeles 58, Calif. . . . or for more information check CP 1532 on handy form opposite last page.)

How to raise steam capacity in existing boiler room

Twelve-page booklet tells how installation of a package steam generator can raise steam capacity in existing boiler rooms without expensive structural changes. Another feature of publication shows plant operators how they can make a professional survey of their own steam requirements. Booklet also includes two installation case histories.

Vol 2, No. 1 of company publication is issued by Cyclotherm Div., National-U.S. Radiator Corp., Dept. CP, Oswego 3, N.Y. When inquiring specify CP 1533 on handy form opposite last page.

OLIVITE® Acid Handling PUMP



Illustrated is the stuffing box assembly of the Olivite Acid Handling Pump.

HOW IT REDUCES MAINTENANCE

1. The stuffing box floats on two rubber rings which permits shaft and packing movement. This minimizes the possibility of crushed packing or scoring of the shaft sleeve.
2. The lantern ring permits circulation of the lubricant, water or solution.
3. The resilient packing is of acid-resisting material styled for long life.
4. Simple spring loaded wing nut adjustment permits application of correct and proper pressure by the yoke on the gland and packing. No "monkey" wrench required.

Thousands of Olivite Acid-Resisting pumps have been supplied to the Process industries during the past 20 odd years. The values of these years of design, manufacturing and operating experience are embodied in every 1¼", 2" or 4" Olivite Pump you purchase. Bulletin 308-R provides full details. When writing us please outline your pumping problems.

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When inquiring check CP 1534 opposite last page

Get faster filtration at lower cost *with this new* Niagara

When your process calls for liquid-solids separation by *filtration*, you can do it more economically with the new Niagara Pressure Leaf Filter.

Doubt it? All right . . . just compare your present labor cost and production figures with the time-and-money-saving advantages you could have with a Niagara Horizontal Pressure Leaf Filter. For example:

- **Flow rates are 2 to 5 times greater than with cloth-covered presses.**
- **The stainless steel leaves require no cloths . . . a big saving in material and labor.**
- **A Niagara can be drained, opened, cleaned, closed, filled and precoated . . . by *one* man . . . in a matter of minutes instead of hours.**
- **No cake disposal problem with a Niagara Horizontal Filter. Just tap or shake the leaves and dry cake drops off into hopper for recovery or dry disposal.**
- **Hydraulically-operated quick-opening cover is standard on Niagara Horizontal Filters, saving time and effort for the operator.**
- **Every Niagara Filter is constructed in accordance with ASME requirements. Pressures up to 75 PSI are standard; can be built for pressures up to 1500 PSI.**
- **Because of their simple fabricated design, Niagaras can be made of stainless steel and other corrosion-resistant materials, with rubber or plastic linings, and jacketed or insulated at less cost than you'd think.**

See what we mean? You can really save time and money with this modern equipment. And the same is true of Niagara Vertical Filters. That's the story you'll get from hundreds of users all over the country. For more details, just clip and mail the coupon. No obligation.

Niagara FILTERS

A DIVISION OF

American Machine and Metals, Inc.

DEPT. CP-1055, EAST MOLINE, ILLINOIS

☐ Send catalog No. CP-1055 ☐ Have representative call

Name and title_____

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Specialists in Liquid–Solids Separation

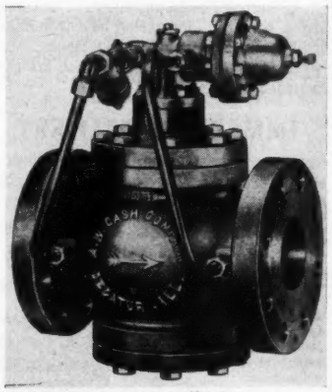
Dial selects range on pilot-operated control valve . . .

piping switch converts unit to back pressure control

Uses: Recommended for water systems, altitude control, as an unloading valve on extrusion presses, for back pressure control, and for oil refineries. Unit may be used with water, gas, air, light oils, and refrigerants, including ammonia and Freon.

Features: Valve has a dial-type range selector used to select throttling range necessary to give most stable and sensitive control for particular process application involved.

Unit may be easily converted from a pressure reducing and regulating valve to a back pressure control valve by switching control piping.



Valve's packless design results in low friction and high sensitivity

Description: Pilot-operated control valve is available in iron, bronze or steel, with bronze or stainless steel trim, and Monel trim on pilot valve and composition or metal seat.

(Pilot-operated control valves are product of A. W. Cash Company, Dept. CP, P. O. Box 551, Decatur, Ill. Check CP 1535 on handy form opposite last page.)

For more information on product at left, specify CP 1536 . . . see information request blank opposite last page.

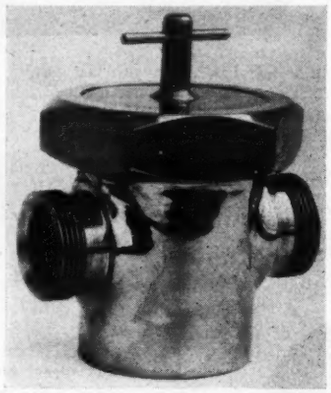
Offers sanitary method of removing ferrous particles . . .

for fluid lines where psi is too great for other traps

Uses: Removal of ferrous particles from fluid lines where pressure is too great for conventional flowline traps.

Features: Maximum protection against ferrous contamination is afforded in trap by forcing a change of direction of flow that moves product completely around magnet. Frictional resistance is compensated for by providing an internal trap area greater than line area that feeds it.

Sanitation and ease of cleaning are assured by polish given trap interior.



Product moves completely around magnet in trap

Description: Sanitary, magnetic, high-pressure traps are available for installation on line sizes from 1 to 2½".

(Model 150 line of magnetic traps is produced by Div. A37, Columbia Engineering Service Company, Dept. CP, 4025-37 Sebastopol Hwy., Santa Rosa, Calif. . . . or for more information check CP 1537 opposite last page.)

For more information on product at right, specify CP 1538 . . . see information request blank opposite last page.

Photo courtesy Eli Lilly & C

Get faster centrifuging at lower cost *with this new* Tolhurst

When your process calls for liquid-solids separation by *centrifugal force*, you can do it more economically with this new Tolhurst Center-Slung® Centrifugal. Here's why:

- **Center-Slungs can safely handle 3 to 4 times greater out-of-balance loads. This means less time and less care required in loading the basket.**
- **Heavy-duty motor brings basket and load up to speed quickly, cutting extraction time to a minimum.**
- **New design of case bottom provides faster, more complete drainage.**
- **Does your process work better when slurry is heated or refrigerated. Center-Slungs can be jacketed for circulating steam or coolant, at minimum cost.**
- **Center-Slungs can be equipped with hydraulic drive which provides infinitely variable speed centrifuging. This means you can centrifuge many different slurries, each at optimum speed, all in the same machine.**

Tolhurst Center-Slungs are available in 7 sizes, with either perforate or imperforate basket and capacities from one to 17 cubic feet per load. They can be built of steel, stainless steel, monel, steel rubber covered and many other corrosion-resistant materials. They're completely described in an illustrated catalog which is yours for the asking.

FREE CENTRIFUGING SLIDE RULE—There's no charge for this pocket-size slide rule which you can use for quickly calculating centrifugal force. Just mail the coupon.

Tolhurst CENTRIFUGALS
A DIVISION OF
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DEPT. CP1055, EAST MOLINE, ILLINOIS

☐ Send new free centrifugal calculator
☐ Send catalog ☐ Have representative call

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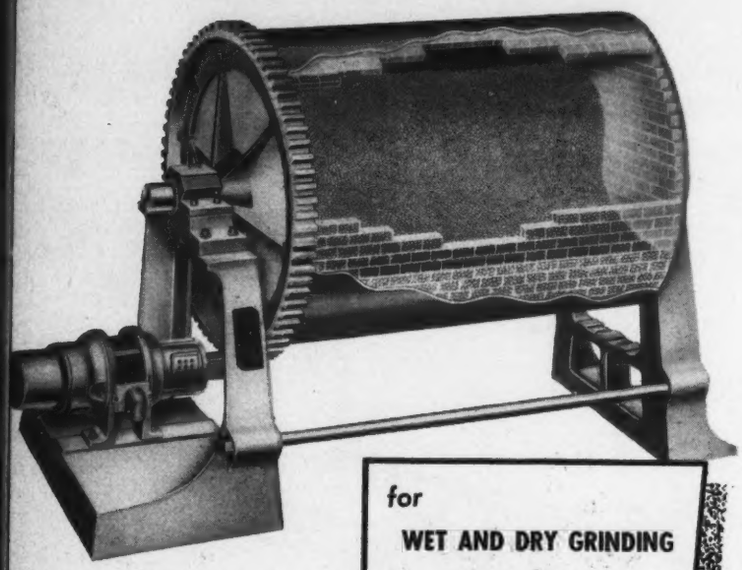
Specialists in Liquid-Solids Separation

ABBÉ Engineering Ball and Pebble Mills



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WET AND DRY GRINDING
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ABBÉ Engineering Ball and Pebble Mills are available in capacities from 30 lbs. (dry), 5 gal. (wet), to 14,000 lbs. (dry), 2500 gal. (wet).

It will pay you to investigate these, as well as Abbé Jar Mills and Jar Rolling Machines, which cover every need and capacity.

Write for Catalogs 73 and 77 and complete data.

ORIGINATORS OF ABBÉ ENGINEERING CO. ABBÉ PEBBLE MILLS

ABBÉ ENGINEERING COMPANY
50 Church Street, New York 7, N.Y.
Address Department 46

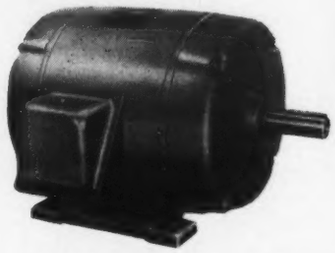
When inquiring check CP 1539 opposite last page

Motors can be used indoors or out . . .

have resistant cast iron frames

Uses: General-purpose applications requiring ball-bearing polyphase motors in re-rated NEMA frame sizes 182 through 326.

Features: Units are suitable for indoor or outdoor use. Frames are smoothly contoured so that moisture cannot collect on surfaces.



Available in 1 to 30-hp ratings

Construction is so drip-proof that motors can be used in applications needing splash-proof units before.

Description: Motors are available in 1 to 30-hp ratings, 3-phase, 60 cy, 1750 rpm. To protect units from moisture, ventilating air intakes are located at bottom of endplates and air outlets are positioned at base of frames on each side.

Specially-formed baffle plates direct air into blowers and through motor and also provide extra protection for stator windings.

(Type DP general-purpose motors are products of Wagner Electric Corp., Dept. CP, 6400 Plymouth Ave., St. Louis 14, Mo. . . . check CP 1540 opposite last page.)

Gives specifications on vacuum pumps

Design and construction features of vacuum pumps and compressors are presented in eight-page bulletin.

Bul 550430 is issued by Lammert & Mann Co., Inc., Dept. CP, 1753 Walnut St., Chicago 12, Ill. When inquiring specify CP 1541 opposite last page.

NEW . . .
an advanced concept in metering small flows

The Brooks Sho-Rate "50" is a new design idea in purge meters. It offers the complete interchangeability, dependability and structural strength that's been needed for a long time.

- *Slip-out Tubes*
- *Side-plate Construction*
- *Rotatable End-fittings*

The Sho-Rate "50" Purge Meter gives all this . . . at a very low cost. *Send for complete facts.*

BROOKS ROTAMETER COMPANY
103 EIGHTH STREET • LANSDALE, PA.
WRITE FOR BULLETIN 135

BROOKS and SHO-RATE are trade-names

When inquiring check CP 1542 opposite last page

"MAGNETIC COUPLING"
Exclusive Feature of
DWYER
MAGNEHELIC PRESSURE GAGE
A Precision Instrument Sensitive to Pressure, Pressure Differentials or Vacuum from 0-1" water or 0-2 psi.

The unique design cannot be harmed by sudden pressure surges, shock loading or severe vibration. For accuracy, sensitivity, and long service life the Dwyer Magnehelic Gage cannot be equalled.

Extreme accuracy results from the elimination of friction between the flexible diaphragm and the indicating mechanism. A magnetic force transmits pressure fluctuations to the 3½" easy-to-read dial of the Dwyer Magnehelic Gage.

Send for Bulletin No. 250 for complete description today.

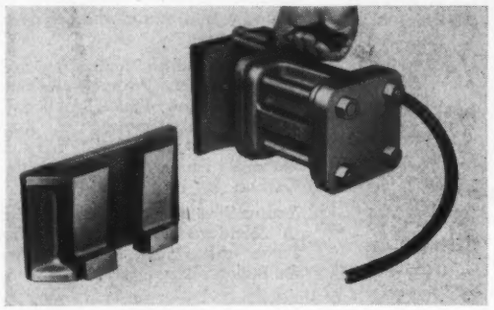
DWYER Specialized INSTRUMENTS and GAGES

F. W. DWYER MFG. CO. • P.O. BOX 373-K • MICHIGAN CITY, IND.

When inquiring check CP 1543 opposite last page

Portable and well balanced, vibrator develops 7000 to 8000 vpm

Vibrator, for use on portable bins, trucks, concrete forms, and large pipe forms, is well balanced, lightweight. Unit was developed for application to situations where permanent vibrator installations are not required. It develops 7000 to 8000 vibrations per minute at maximum efficiency and is available with sturdy cast steel bracket for easy attachment.



Vibrator is available with cast steel bracket for easy installation

(Type LSRRH portable vibrator is a product of Cleveland Vibrator Co., Dept. CP, 2828 Clinton Ave., Cleveland, Ohio . . . or for more information reader may simply check CP 1544 on handy form opposite last page.)

Designed for petroleum products under pressure or suction . . .

hose coupling permits simplified replacement of swivel ring

Uses: Handling of petroleum products under pressure or liquids where suction or discharge is involved.

Features: Groove on flange provides abundant anchor area for hold-back wire under severe pressure conditions. Tie wire which secures swivel ring to shank permits replacement of ring should threads be damaged reducing the necessity of discarding entire unit.

Description: Coupling, available in 2 and 3" sizes, is non-sparking, and has full flow design. Shank is sufficient for two bands or clamps. Corrugated design of shank gives positive hose gripping area with out injuring hose. Cast-in flange protects hose fabric material from fraying.

(Universal union shank hose coupling No. 800 is available from Universal Valve Co., Dept. CP, PO Box 444, Elizabeth, New Jersey . . . or for more information check CP 1545 on handy form which is located opposite last page.)

HEAT EXCHANGERS BY THE MILE

If you watch production at the Kewanee-Ross plants, you'll see the world's most modern heat exchanger assembly techniques at work . . . moving exchangers and condensers down the lines by the thousands . . . to serve industries here and abroad.

Complex, highly specialized refinery exchangers and giant power plant surface condensers . . . one of a kind or dozens alike. Completely standardized engine oil and water coolers, compressor inter and after coolers, hydraulic fluid coolers . . . hundreds upon hundreds of identical units. End-to-end, they would stretch out for miles.

Standardized or specialized, mammoth or pocket size, single or by the thousand . . . whatever industries require in heat exchangers, Kewanee-Ross makes it. In its long, diversified experience, this Company has engineered and built virtually everything that is sound and practical in heat transfer equipment.

Where can you find a more qualified source for serving *your* requirements? Who could possibly be in a better position to work with you . . . to recommend and *deliver* exactly what you need? Your request will bring a Kewanee-Ross engineer promptly to your desk. Write.

KEWANEE-ROSS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
1403 WEST AVENUE • BUFFALO 13, N. Y.
In Canada: Kewanee-Ross of Canada Limited, Toronto 5, Ont.

MEMBER T.E.M.A.

Serving home and industry: AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS • SUNBEAM AIR CONDITIONERS

When inquiring check CP 1546 opposite last page

MAIL COUPON BELOW

The BETTER the ODOR the BIGGER the SALES!

DISPEL THE DANK, CLAMMY ODOR OF DAMPNESS . . .

NEUTROLEUM* *will not* remove the *water* from flooded cellars, or the *dampness* from unwaterproofed basements, or the *clamminess* of an unheated, unoccupied building . . . but it will dispel the muggy, dank, unpleasant *odors* that accompany such conditions. By spraying a small amount of NEUTROLEUM into poorly ventilated areas, the unpleasant odors given off by confined, humid air can at least be temporarily alleviated . . . This is but one of the many, many situations involving objectionable odors that our Industrial Odorant Division can help you to overcome. To obtain our suggestions, describe your problem on company letterhead or use coupon below.

*Reg. U. S. Pat. Off.

PLEASE FILL IN AND MAIL

FRITZSCHE BROTHERS, Inc.
76 NINTH AVE., NEW YORK 11, N. Y.
We are interested in ☐ PERFUMES ☐ ODOR NEUTRALIZERS for use in the manufacture of products checked below. What do you recommend?
☐ ADHESIVES ☐ FINISHES ☐ INK
☐ LEATHER ☐ PAINT ☐ PLASTICS
☐ PETROLEUM PRODUCTS
☐ POLISHES ☐ RUBBER ☐ SOLVENTS
☐ SPRAYS ☐ TEXTILE CHEMICALS
☐ OTHERS: _____

(Note: Please send accompanying letter giving details of your particular problem.)

COMPANY: _____
ADDRESS: _____
CITY: _____ STATE: _____
ATTENTION: _____
TITLE: _____

FRITZSCHE Brothers, Inc.
Established 1871
PORT AUTHORITY BUILDING
76 NINTH AVENUE, NEW YORK 11, N.Y.

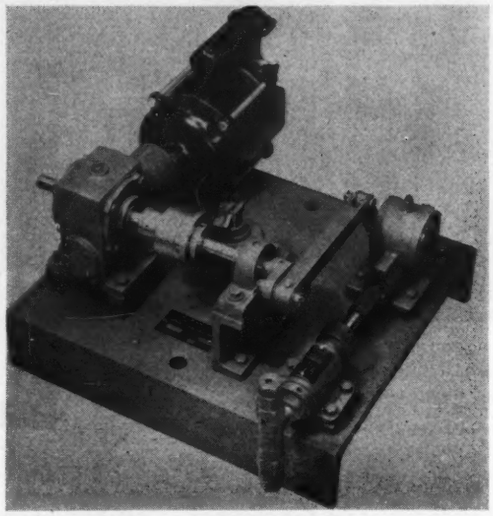
When inquiring check CP 1547 opposite last page

One stroke of pump plunger given by solenoid-operated clutch in response to signal . . .

positive-displacement pump effects feed rate to main line at regular intervals

Uses: Automatic or timed proportioning of chemicals, such as addition of boiler feed compounds.

Features: Solenoid operated single revolution clutch permits one stroke of pump plunger in response to an electrical signal.



Pump actuates in response to signal from flow meter, differential meter, or program timer

Description: Electrical signal operating clutch may be timed to effect a feed rate to main flow line at regular intervals. Electrical impulses can originate from mechanical flow meter, differential meter, gravimetric meter, or program timer. Pump is available in maximum capacities from 0.10 gph to 20 gph per feed. Single feed is standard but two-feed units are available; operating pressures to 5000 psi.

(UMC positive-displacement pumps are a product of Hills-McCanna Co., Dept. CP, 3025 N. Western Ave., Chicago 18, Ill. . . . or for more information check CP 1548 on handy form opposite last page.)

Covers steam generators in nine sizes

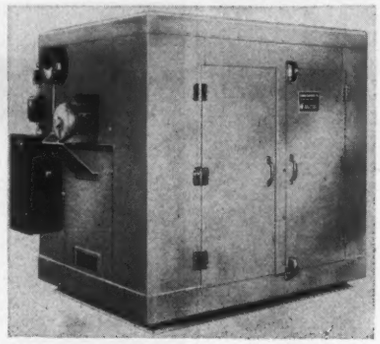
Steam generators in nine sizes, with capacities from 50,000 to 150,000 lb/hr are covered in four-page bulletin. Schematic and cutaway drawings of the units described are shown.

Bul B-55-4 is issued by Foster Wheeler Corp., Dept. CP, 165 Broadway, New York 6, N. Y. Specify CP 1549 opposite last page.

YOUNG BROTHERS OVENS and DRYERS

for Uniform Results in

Baking, Drying, Curing, Dehydrating



Electrically heated, multiple shelf-type dryer with automatic indicating control

Young Brothers designs and builds Ovens and Dryers to meet the special needs of the chemical field. Efficient, trouble-free processing is assured through accurately controlled temperatures and positive air circulation.

Among leading concerns using Young Brothers Ovens are Reichhold Chemicals, Inc., Parke, Davis & Co., Glidden Co., Upjohn Co., Atomic Energy Commission, E. Lilly Co., General Foods, Union Carbide & Carbon.

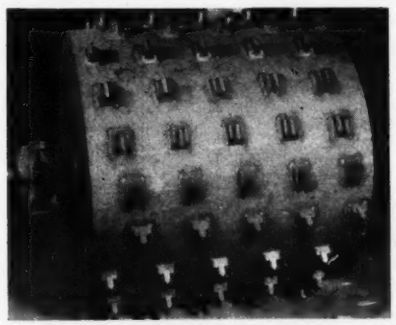
Young Brothers Ovens are available in Standard and Special Designs, Batch and Conveyor Types. Write for Bulletin 17 today!

YB

YOUNG BROTHERS COMPANY

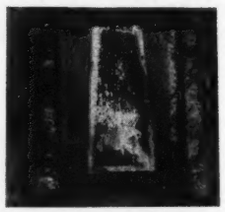
1825 Columbus Road Cleveland 13, Ohio

When inquiring check CP 1550 opposite last page



New tooth arrangement on cylinder at left assures more effective opening of bales.

Below is empty tooth socket which is welded to Taylor-Stiles Bale Breaker Cylinder.



Taylor-Stiles Bale Breakers Have *Removable Teeth*

Bale Breaker teeth naturally take a severe "beating."

In previous types of machines when the teeth wore down the whole cylinder generally had to be replaced. Not so with the new Taylor Stiles Removable Teeth Cylinder.

Only the tapered socket, not the entire tooth, is welded to the cylinder. The tooth is driven into this socket. The direction of cylinder revolving tightens the tooth in the socket.

When the tooth finally does wear down it can be driven out of the socket and can be replaced with a new tooth.

Write today for complete description of Taylor Stiles Bale Breaker and the new Removable Tooth Cylinder.

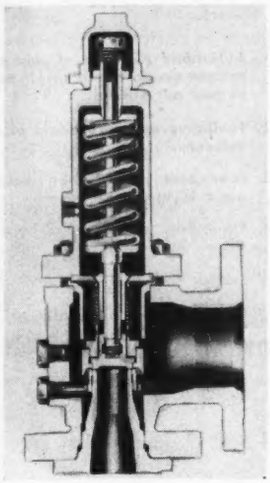
TAYLOR-STILES & COMPANY
20 Bridge Street, Riegelsville, New Jersey

When inquiring check CP 1551 opposite last page

Bellows failure reduced with protective shield on relief valve . . .

designed for protection against fouling and corrosion

Uses: Relief of pressure, in range from 25 to 2500 psi, for gas, steam, liquids, and flashing fluids.



All moving parts of valve are held in alignment by a single member

Features: Bellows protector shields bellows from adverse turbulent effects of flowing media, preventing premature failure due to fatigue. Protector also acts as positive lift-stop preventing over-compression.

Description: All moving parts of valve are guided and held in alignment by a single member, reducing fouling. Unit is forged stainless steel to resist corrosion, and seating surfaces can be reconditioned quickly, at lows cost, in the field. Valve is furnished in 1 to 6" inlet sizes. Internal heating and flushing coils are available where required.

(Model JB Protecto-Seal Bellows Relief Valves are a product of Crosby Steam Gage and Valve Co., Dept. CP, 43 Kendrick St., Wrentham, Mass. . . . or for more information check CP 1552 on handy form opposite last page.)

Faster-response thermocouples using simple seal explained

Use of bare wire thermocouples, whose low mass permits fast response, is possible with seal that is effective from full vacuum to 15,000 psi. Twenty-page, two-color catalog presents seal design and comparison curves for bare wire and standard thermocouple response. Catalog also lists specifications on thermocouples, protection tubes, packing glands, and insulators. Sealant selection table offers choice of operating temperature and pressure ranges.

Catalog 1542 is issued by Conax Corp., Dept. CP, 7811 Sheridan Drive, Buffalo 21, N. Y. When inquiring reader may simply specify CP 1553 on handy form which is located opposite last page.

makes products finer, faster, cheaper in a Gaulin Homogenizer

Besides making stable emulsions and dispersions, a Gaulin Homogenizer accents the *dominant* characteristics of a product. By forcing them at tremendous velocity through a microscopic orifice, a Gaulin smashes agglomerates down to their ultimate particle size.

Breaks them uniformly finer . . . mixes them evenly . . . to provide a host of important advantages.

For example, a Gaulin provides a *smoother* texture, a *freer* flow. *Accents* the taste, scent and color of a product. *Speeds* chemical reactions, or *disperson* of ingredients — and *reduces* the amount of costly essential ingredients required. *Stops* separation and *improves* lubricity. Just to mention a few.

How about your product?

We'll be glad to show you just how a Gaulin can *improve* your product, *cut* your processing costs — and work with you toward solving any specific problems you may have. Write today for more information.

MANTON-GAULIN MFG. CO., INC., 55 Garden Street, Everett 49, Mass.

Some Typical Products Improved by Gaulin Homogenizers

PHARMACEUTICAL
Emulsions and dispersions. Gaulins make them stable, uniformly finer. Permit accurate reproduceability.

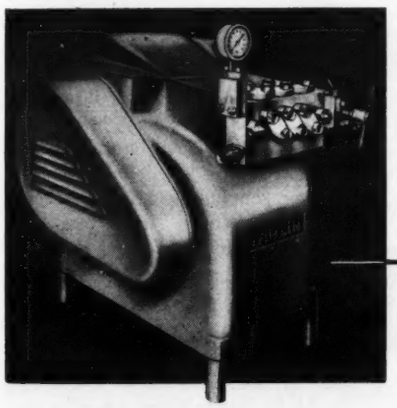
LIQUID STARCH
Improves transparency, clarity, and stops separation, at lower cost than other methods.

GREASE
Improves lubricating value and stability. Increases service life.

PIGMENT DISPERSIONS
Provides continuous high capacity producing dispersions of ultimate particle size.

COSMETIC EMULSION
Gives smoother texture, longer shelf-life. Locks in perfume against evaporation.

WAXES
Makes accurate reproduceability possible. Provides uniform, stable emulsions and convenient viscosity control. Increases gloss.



GAULIN PILOT PLANT HOMOGENIZER
Ideal for experimental purposes, operation or process requiring up to 25 gallons per hour capacity. Handles quantities as small as one pint. Available on low rental basis.

GAULIN TWO-STAGE COLLOID MILL
Stator is jacketed for cooling or heating. Gap setting adjustable for .001" to .045". Only 45 seconds clean-up required in changing colors. 12" head room. 12" x 17" floor area.

Gaulin

HOMOGENIZERS

WORLD'S LARGEST MANUFACTURER OF HOMOGENIZERS, TRIPLEX STAINLESS-STEEL HIGH PRESSURE PUMPS, AND COLLOID MILLS

When inquiring chcek CP 1554 opposite last page

CARBON STEEL

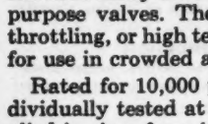
R-P&C Bar Stock Valves

• RATED FOR 10,000 PSI

• FOR CLOSE CONTROL, HIGH TEMPERATURES OR PRESSURES

These rugged bar stock valves were originally developed by R-P&C for close control or instrument use. However, their versatility has proven itself in so many different applications that they are now considered general purpose valves. They are particularly applicable for services involving throttling, or high temperatures and pressures, and are especially adapted for use in crowded applications such as panel boards.

Rated for 10,000 psi at 150°F., each carbon steel bar stock valve is individually tested at 15,000 psi before leaving the factory. They are supplied in sizes from ⅛ to 1", in globe and angle styles with female ends, male and female ends, or male union ends. They can be furnished in 12-14 chromium stainless steel and 18-8 molybdenum stainless steel for corrosive applications. May also be supplied with special stellite discs for extra abrasion resistance in extremely severe throttling services. Those other than carbon steel are rated at 4,000 psi at 150°F.



FREE WALL CHART

"How to Protect Your Valves" 17 x 22" wall chart gives installation and operation pointers. Tells how to protect valves, prolong life. Write for your copy.

R-P&C's complete selection of bar stock valves is only one element in a complete valve line which includes gate, globe, angle and check valves in a wide range of sizes and styles, in bronze, iron and cast and forged steel. ***See your R-P&C Distributor or write for catalog.***

ACCO

R-P&C Valve Division

AMERICAN CHAIN & CABLE

Reading, Pa., Atlanta, Boston, Chicago, Denver, Detroit, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

R-P&C valves

When inquiring check CP 1555 opposite last page

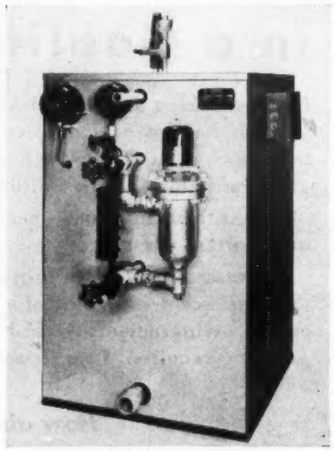
ENGINEERING

No low water damage in generating steam electrically . . .

precise control of high pressure steam temp possible

Uses: As a supplementary steam source for areas remotely located from central boilers, in places where fuel-fired boilers create an explosion, fire, or fume hazard, or wherever precise control of high pressure steam temperature is desired.

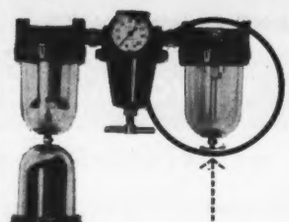
Features: Packaged steam generator produces steam by the resistance of water to passage of current between solid metal electrodes. No low water damage is possible because current drops as water level in generating chamber drops.



Packaged steam generators operate on electrode principle

Description: Generator design keeps electric input in precise balance with steam output. Efficiency is reported to be 98½%; power factor 100%. Generator may be operated on 220, 440, or 550v power supply. No stacks or flues are needed. Sizes range from 1½ to 60 bhp and 15 to 500 psi.

(Speedylectric steam generators are a product of Pantex Manufacturing Corp., Dept. CP, 417 Roosevelt Ave., Pawtucket, Rhode Island . . . or for more information check CP 1556 on handy form which is located opposite last page.)



for conditioning and control of compressed air

arrow

Autopneumatic control assembly . . . or individual units

TRUE MIST LUBRICATOR

Pipeline Sizes:

¼" — ⅜"
½" — ¾"
1" and larger

1. Automatic delivery of mist lubricant proportional to air flow at any adjustment.
2. Tamper-proof adjustment of oil delivery.
3. Lubricates only when equipment is in operation.
4. Eliminates excessive or insufficient lubrication.

SEND FOR CATALOG AND LITERATURE

arrow tools, incorporated

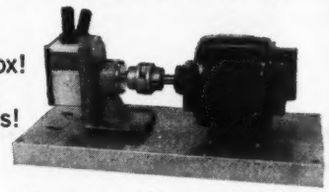
1904 S. Kostner Ave., Chicago 23, Ill.

When inquiring check CP 1557 opposite last page

THE PROBLEM:
PUMPING SULPHURIC ACID

THE SOLUTION:
VANTON PLASTIC PUMP

No stuffing box!
No gasket!
No shaft seals!



A leading producer of welding gas had the problem of transferring concentrated sulphuric acid (93%) from storage to process tanks. The pump had to operate 6 to 10 hours daily and deliver 10 gpm against a 15 ft. head. The answer was found in a Vanton "flex-i-liner" pump, model PX60, with its polyethylene body block and hypalon flexible liner.

If you're troubled with pumping corrosive or abrasive liquids and slurries, get the facts on the Vanton "flex-i-liner."

Catalog 55 on request.

VANTON

PUMP & EQUIPMENT CORP.

201 Sweetland Ave. Hillside, N. J.

division of Cooper Alloy Corporation

When inquiring check CP 1558 opposite last page

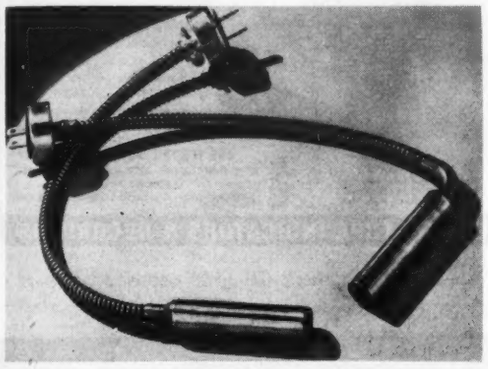
Greater mechanical protection for electric cartridge heater lead wires provided . . .

flexible brass conduit lead wire enclosure gives high safety factor

Uses: Protection of electric cartridge heater lead wires against abrasion, flexing stress, and other moving parts.

Features: Flexible conduit and fittings are firmly attached to cartridge sheath, are unaffected by operating temperatures. Lead wire life expectancy is greatly increased.

Description: Strong, rust-proof, flexible brass conduit gives a high safety factor where lead wires



Flexible conduit may be obtained with straight connection or with 90° fitting

are normally exposed to operator. Flexible conduit is available on new electric cartridge heaters of ⅜, ½, ⅝, and ¾" diameters. It can be supplied with straight connection or with 90° fitting for use in confined spaces.

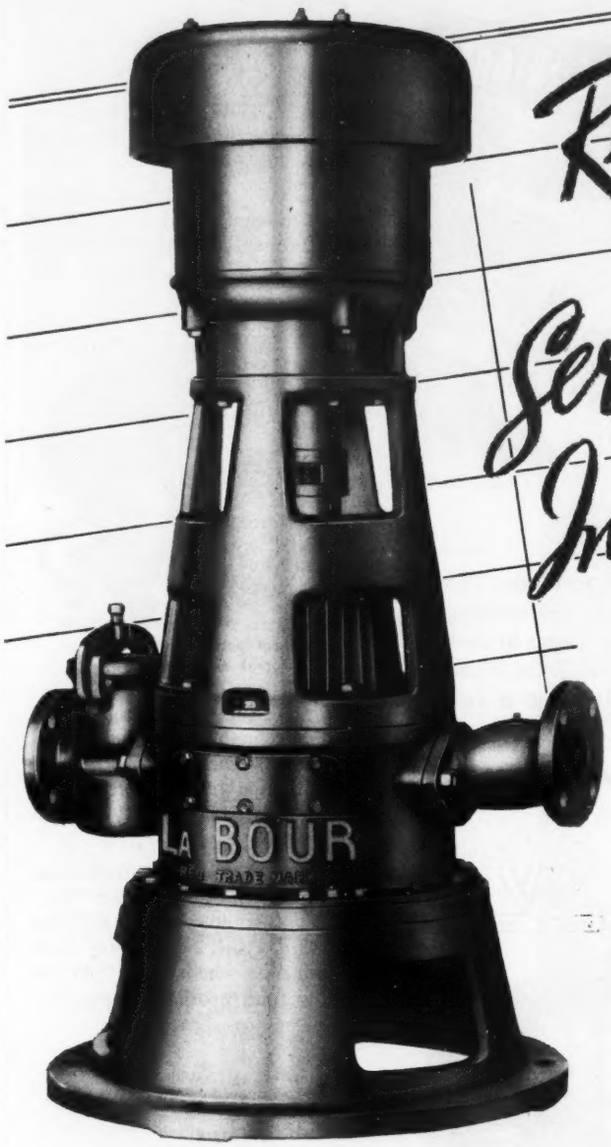
(Chromalox electric cartridge heater units are a product of Edwin L. Wiegand Co., Dept. CP, 7500 Thomas Blvd., Pittsburgh 8, Pa. . . . or for more information check CP 1559 on handy form which is located opposite last page.)

Covers operating characteristics of speed variator

Charts and graphs cover efficiency curve, speed-change characteristics, speed-regulation curves, and ratings of speed variator in eight-page, two-color brochure. Sectional drawings and exploded views detail construction features. Standard dimensions are given.

Bul K-200 is issued by Cleveland Worm and Gear Co., Dept. CP, 3261 East 80th Street, Cleveland 4, Ohio. When inquiring specify CP 1560 on handy form opposite last page.

how to avoid the high cost of



Repairs and Service Interruptions

Records over the past ten years show that LaBour PACKINGLESS Type G pumps in chemical service cost little or nothing—yes, nothing—for repairs. (There are Type G's running with all original parts after as much as seven years of service. A figure of a dollar or two per month per pump for repair parts is not uncommon.)

This means, of course, that time out for repairs is also at a minimum, as is the cost of labor for making the repairs.

So if pump service costs are running high in your plant, the logical answer to your problem is LaBour Type G. The new CG handles flooded suction as well as suction lift applications, so this economy is available in a wide range of services. Ask for Bulletin G-1.

ORIGINAL MANUFACTURERS OF THE SELF-PRIMING CENTRIFUGAL PUMP

LABOUR

THE LABOUR COMPANY, INC. ★ Elkhart, Indiana, U.S.A.

When inquiring check CP 1561 opposite last page

50 Years have changed a lot of things!

...including

DUST CONTROL

Times have changed . . . so have dust control methods. The DAY Company has played an important part in modernizing the control of dust with a new concept, a new design in dust filtering. The DAY High Pressure, Reverse Jet Dust Filter manufactured under DAY and Hersey patents is a real departure from "yesterday's" type filter.

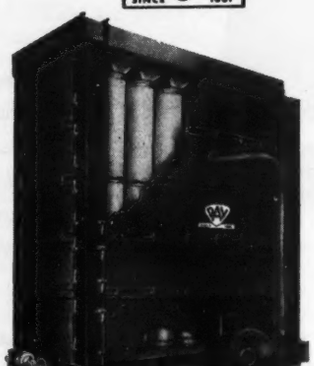
THE DAY "AC" FILTER PROVIDES ADVANTAGES FOUND IN NO OTHER FILTER

It saves valuable plant space because a smaller unit handles more dust laden air. Installation time is cut to a minimum because it is pre-assembled at the factory. The DAY "AC" High Pressure, Reverse Jet Filter brings to industry such advanced features as self-adjusting cleaning rings; square-to-round streamlined dust-laden air inlets; dust separation from different exhaust systems within one filter and multiple screw conveyor discharges. These and many more features give you the most efficient dust filtering at the lowest cost.

Leading companies have used DAY High Pressure, Reverse Jet Filtering for five years. 87% of DAY filter users have *ordered additional* DAY Reverse Jet Filters.

For facts about modern dust filtering—write toDAY for Bulletin 528R.

DAY SINCE 1881



Cutaway view of the DAY Dust Filter —available housed or unhoused—for use on either vacuum or pressure. (Licensed by H. J. Hersey, Jr.)

The **DAY** *Company*

852 Third Ave. N.E., Minneapolis 13, Minn.
IN CANADA: P.O. Box 70Y, Fort William, Ontario
Branch Plants: Buffalo, Fort Worth & Toronto, Ont.
Representatives in Principal Cities

STOP AIR POLLUTION with **DAY** DUST CONTROL

When inquiring check CP 1562 opposite last page

No lubrication needed on self-contained compressor . . .

compact, portable unit delivers up to 100 psi

Uses: Powering pneumatic devices where piped compressed air is not available.

Features: Sealed ball bearings used throughout need no lubrication. Compressor delivers 3.5 cfm free air at pressures up to 100 psi.

Compact portable unit needs no tank or safety valve

Description: Unit weighs 40 lb. Overall length is 13″ and overall height 10″. Compressor is complete with built-in intake filter, 1/3 hp motor. No tank or safety valve is required.

(Model 100 portable compressor is a product of Modernair Corp., Dept. CP, 400 Preda St., San Leandro, Calif. . . . or for more information check CP 1563 on handy form oposite last page.)

Detailed description of lube pumps

Four two-page bulletins give detailed descriptions of lubrication pumps. Each bulletin refers to a particular series of pumps and gives design features, with diagrams operating specifications.

Bulletins on lubrication pumps are issued by Trabon Engineering Corp., Dept. CP, 1814 E. 40th St., Cleveland 3, Ohio. When inquiring specify CP 1564 on handy form opposite last page.

Depend on **AUTO-LITE** for Temperature Indication

You Benefit from Eye-Level Readings

Auto-Lite offers many thermometer styles, permitting plant-wide temperature observation at low cost. Standard temperature ranges from minus 60°F to plus 750°F. Send for latest catalog showing various types.

Rigid stem or capillary tubing for EYE-LEVEL remote reading. Priced from $22.

THE ELECTRIC AUTO-LITE COMPANY
INSTRUMENT AND GAUGE DIVISION
TOLEDO 1, OHIO
NEW YORK • CHICAGO • SARNIA, ONTARIO

TEMPERATURE INDICATORS & RECORDERS

When inquiring check CP 1565 opposite last page

NOTHING BEATS R/M Teflon* FOR PACKING CHEMICAL PUMPS

Everywhere they're being used on chemical pumps and valve stems, packings made of R/M "TEFLON" are doing a tremendously efficient job. With their help, it is possible to meet most any chemical packing problem. Carefully engineered and custom-built for their applications, they are lasting longer in service and lengthening the life of the equipment they're used on. Actually, they're going a long, long ways towards making preventive rather than corrective maintenance possible. Write for complete information.

**Du Pont's trade-mark for its tetrafluoroethylene resin*

R/M **PACKINGS**
RAYBESTOS-MANHATTAN, INC.
PACKING DIVISION, PASSAIC, N.J.

When inquiring check CP 1566 opposite last page

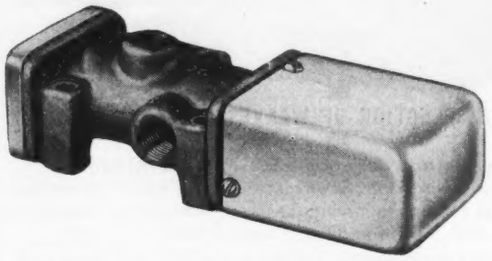
Precise regulation, fast response in control of air at pressures up to 150 psi . . .

valve action features single internal moving part

Uses: Control of flow of air, at pressures up to 150 psi, for air cylinder operation.

Features: Floating spool and two built-in speed controls accurately regulate air cylinder advance and retract speeds by metering exhaust air.

Description: Single internal moving part, an aluminum piston, slides within chromed inserts on



Solenoid-operated valves are available for 115, 230, or 440 volt operation

O-rings with no metal-to-metal contact. All component parts are of materials impervious to rust and similar deterioration. Valves are in sizes of ¼, ⅜, and ½" for manual or electrical control.

(Bel-air cylinder control valves are a product of Bellows Co., Dept. CP, 230 W. Market St., Akron, Ohio . . . check CP 1567 opposite last page.)

Ten years operation at 325°F possible for motor insulated with silicone enamel . . .

permits 50% reduction in insulation thickness

Uses: Electrical wiring insulation for motors, transformers, and coils of high-temperature relays.

Features: Use of enamel as insulation for electric motor has allowed operating temperatures of 325°F. Lab tests indicate that motor could operate at this temperature for 10 years. Replacing present high-temperature insulation, enamel permits a 50% reduction in insulation thickness.

Description: Enamel is a modified polyester-type resin containing about 20% silicone. It has high resistance to flow under pressure, and attack from Freon 12 and 22. Enamel has been successfully applied to all sizes of copper wire from 10 to 40 gage.

(Enamel 1267 is a product of Westinghouse Electric Corp., Dept. CP, 401 Liberty Ave., PO Box 2278, Pittsburgh 30, Pa. . . . check CP 1568 opp. last pg.)

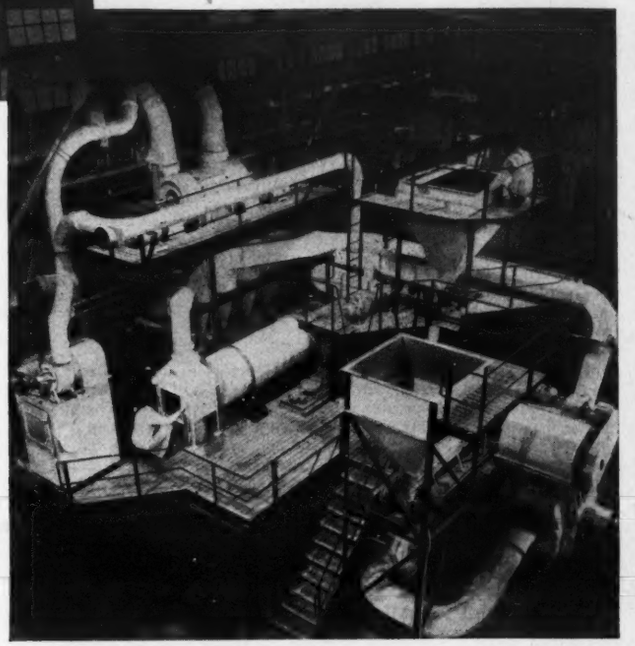
YOU'RE INVITED

to send us a sample

of your material

. . . a pound

or a ton . . .



In fully-staffed, modern laboratory, miniature equipment is used to test small batches sent to Link-Belt.

Full-scale facilities are used for large runs. Over 1000 of these tests have been made, on more than 100 products.

•

We'll work out drying, cooling or roasting procedures for you

WHAT'S the best drying, cooling or roasting method for processing your materials? Hundreds of plants throughout the world have found an exact, detailed answer through Link-Belt test runs. Here's how it works:

- You send a representative sample of your product — a pound or a ton — with a complete description . . . covering initial moisture, critical temperatures and your merchandising objectives.
- On equipment like that shown above, our specialists conduct test-runs — find how to blend, compound or convert it to desired chemical composition. Our analytical laboratory will determine needed catalyst or agents to be added, if tests so indicate.
- With probable efficiencies decided, we'll lay out flow charts of methods you can follow in your own plant.

If shipping your product is impractical, we'll gladly set up a pilot unit on loan at your plant. Write or send samples to LINK-BELT COMPANY, 300 West Pershing Road, Chicago, Ill.

LINK-BELT

DRYERS • COOLERS • ROA$TERS

ROTO-LOUVRE MULTI-LOUVRE OSCILLOUVRE MONOTUBE

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,792

When inquiring check CP 1569 opposite last page

Keep Ahead . . . With "NATIONAL" Conveyor Dryers

You can stay in the lead . . . with faster production, lower operating costs and improved product . . . through operation of "NATIONAL" Conveyor Dryers . . . the ultimate in modern Dryer design and efficiency. Pictured above: Upper, large Multiple-Unit, Multiple-Apron dryer; lower, fourteen-section Multiple-Unit Single-Apron machine.

NEW "P-4" CONSTRUCTION

"P-4" Construction means a precision-built, prefabricated, truss-type structure, providing a new measure of strength, rigidity and durability. Advantages to the customer are obvious: Longer service life for the Dryer; smoother operation; freer access for cleaning and maintenance; and reduction of installation time in the customer's plant of as much as 50%. Another important feature of "P-4" Truss Type Construction is that the special method of attaching the panels meets all Underwriter's Codes covering explosion hazards.

IMPROVED HOUSING PANELS

The new insulated panels (Patented and Patents Pending) used for the housing are larger, stronger, more rigid, and, with their 4" insulation, provide greater protection against heat loss. They are of trussed-and-tensioned, non-through-metal construction and incorporate expansion-contraction compensation.

IMPROVED AIR DISTRIBUTION AND CONTROL

The exceptionally high drying speed of "NATIONAL" Dryers results from a combination of adjustable fan power and unique air distribution system, controlled to assure equal volume of air to the entire run. There is no "shading" — no uneven drying. This arrangement permits drying at consistently higher speeds than those previously permissible. Patented Indexing Orifices, Turning Vanes and other devices and arrangements assure unequalled versatility and precision in air distribution and control.

SUPER-POWER FANS

"NATIONAL" has developed the adjustable-pitch principle into its axial-flow fans which provides for greater operating potential than heretofore used in any drying machinery. Greater speeds and volume of air can now be employed and adjusted to the specific requirements of the drying operation. The new fan construction includes special alloyed metals fabricated by an improved welding technique. The Fan mountings, insulation and lubricating systems have also been redesigned to provide improved smoothness of operation and virtually no maintenance. Other features of "NATIONAL" Conveyor Dryers include continuous hopper feeds; automatic leveler to conveyor belt; pressure extraction and heating for pre-drying.

Write for Complete Information

THE NATIONAL DRYING MACHINERY CO.
LEHIGH AVENUE and HANCOCK STREET
PHILADELPHIA 33, PENNA.

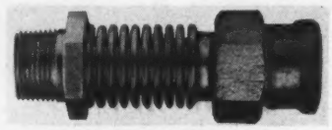
New England Agent: JONES & HUNT, INC., Gloucester, Mass.
Cable Address: "NADRYMA" — W. U. Code

When inquiring check CP 1570 opposite last page

Misaligned piping joined without strains using flexible nipple

Uses: Joining misaligned piping, header to boiler connections, or where moderate vibration or pipe movement is a problem.

Features: Flexible portion of nipple has deep annular convolutions which permit easy stretching, bending, or compressing to fit into available space precluding shearing of pipe or nipples under strain.



Deep annular convolutions permit flexibility

Description: Nipples are all bronze-brass construction having a union fitting on one end and male fitting on opposite end. Assemblies are available with fittings and lengths as desired.

(Flex Nipple is a product of Techniflex Corp. Dept. CP, 55 Jersey Ave., Port Jervis, N.Y. . . . or for more information check CP 157! on handy form opposite last page.)

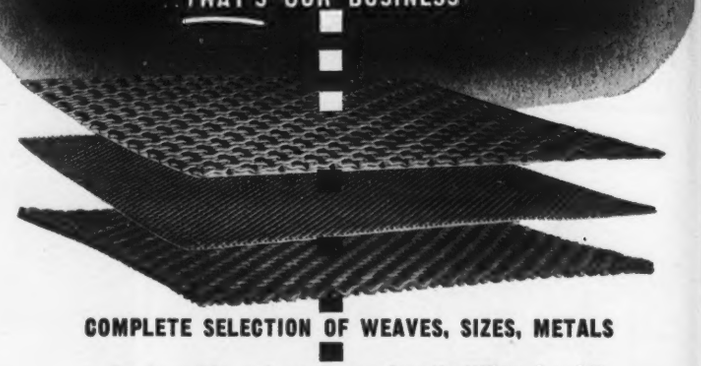
Sound film in color describes fans

Covering industrial axial flow fans, sixteen mm sound film in color describes the three basic types of axial flow fans, their inherent characteristics, and methods of testing employed in fan engineering laboratories.

Movie also discusses subject of static pressure limitations of propeller fans and the common misconception regarding noise levels of these units. Also included is a method of determining reliable fan performance and rating data. Movie runs 12½ minutes.

For complete details or information regarding the availability of this film write direct to Aerovent Fan Company, Incorporated, Dept. CP, 731 East Ash Street, Piqua, Ohio.

Sure, we sell HOLES but our
STRAINERS & FILTERS
ARE MADE OF REAL QUALITY MATERIALS
BY MASTER CRAFTSMEN
THAT'S OUR BUSINESS



COMPLETE SELECTION OF WEAVES, SIZES, METALS

For long life and accuracy—Specify "Cleveland." We weave wire cloth & wire screens, we fabricate strainer and filter screens to individual job requirements. Quantities: One to One Million in all commercial metals and alloys. We have the equipment, facilities, and experience to better serve your needs for strainer and filter elements.

WRITE FOR BULLETIN No. 7

THE CLEVELAND WIRE CLOTH & MFG. CO.
3573 E. 79th STREET • CLEVELAND 5, OHIO

When inquiring check CP 1572 opposite last page

COLTON
FINEST QUALITY
STAINLESS STEEL TANKS
ALL TYPES—STORAGE—PROCESS
•
AGITATORS
ALL TYPES—PORTABLE—BUILT-IN
Write for Literature
ARTHUR COLTON COMPANY
Established 1887
Div. Snyder Tool & Engineering Company
3400 E. LAFAYETTE • DETROIT 7, MICHIGAN

When inquiring check CP 1573 opposite last page

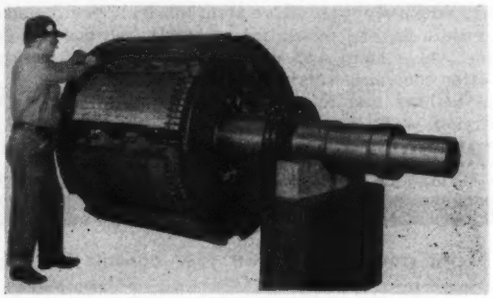
Flexible fingers reduce failures on large motors with severe starting requirements . . .

cage winding makes possible several starts a day for motors driving high inertia loads

Uses: For large synchronous motors with severe starting requirements such as centrifugal compressors.

Features: Damper bars are brazed to end ring and are free to expand and contract against flexible fingers. There are no heavy stresses on damper bars even with slow or repetitive starts.

Description: End ring has three-way give against expansion and high heat dissipating capacity. In addition to flexible fingers, ring is designed to be flexible in a radial direction to prevent transfer of radial forces and in a circumferential direction to



Rotor for 6000-hp motor equipped with flexible finger cage winding. Motor drives compressor

allow for thermal expansion. Entire cage winding is anchored to rotor shaft by means of retaining rings.

(Cage winding for large synchronous motors is product of Electric Machinery Mfg. Co., Dept. CP, 1331 Tyler St. NE, Minneapolis, Minn. . . . or for more information check CP 1574 on handy form opposite last page.)

Design of rotary pump permits 28 piping arrangements

Availability of rotary pump as a monobloc permits 28 possible piping arrangements by means of two suction and two discharge outlets. This arrangement provides many space and cost saving advantages. Motor in unit is connected to rotary pump with a coupling, enabling easy pump replacement and eliminating shaft alignment problems. Capacities range up to 25 gpm and pressures to 150 psi.

(GA rotary pump as monobloc is product of Worthington Corp., Dept. CP, Harrison & Worthington Ave., Harrison, N.J. . . . or for more information check CP 1575 on handy form opposite last page.)

Hard-boiled acids can't corrode Aloyco "Hastelloy" Valves

The fight against corrosion by hot mineral acid solutions is being won by the Hastelloys.

This family of alloys plays a major role in the production of Aloyco corrosion-resistant valves. And here's why:

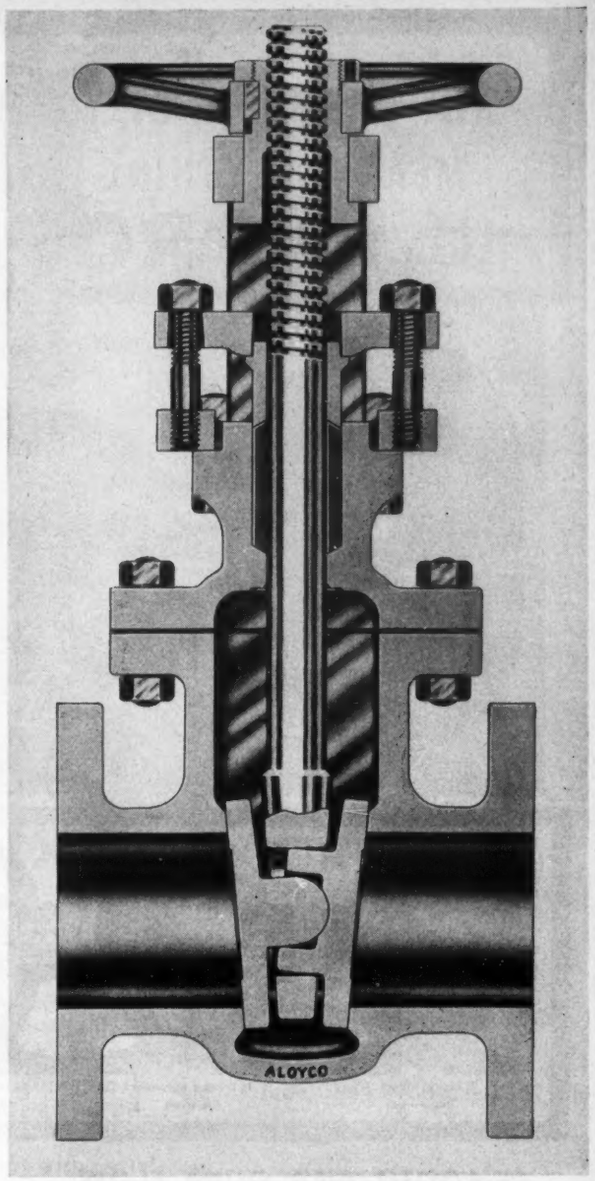
Hastelloy Alloy B is the only available alloy, with the exception of noble metals, that resists hydrochloric acid in all concentrations—even at boiling temperatures. It also withstands corrosion by hot sulfuric acid concentrations where other materials have been found unsatisfactory.

Hastelloy Alloy C at room temperature has good resistance to wet chlorine gas, hypochlorites and other solutions containing chlorine. It is also outstanding for its resistance to secondary spin bath solutions encountered in the rayon industry.

Hastelloy Alloy D has excellent resistance to sulfuric acid at high concentrations and elevated temperatures. It outperforms all other materials in resisting sulfuric acid solutions containing hydrocarbons, coke and tar encountered in oil refineries.

This remarkable Hastelloy family is now available in a wide range of Aloyco valve designs. Cast by induction melting of master heat ingots, Hastelloy valves undergo a special annealing process that imparts better machining qualities . . . assures maximum corrosion resistance. A new bulletin, couponed below, will provide you with complete information.

Write today to: Alloy Steel Products, Inc., Linden, N. J.



Aloyco Hastelloy Valves are suited by composition and a special annealing process to handle hot solutions of mineral acids.

S.15

Alloy Steel Products Company, Inc.
1302 West Elizabeth Avenue
Linden, New Jersey

Gentlemen:

Please send me a free copy of your new Bulletin No. 10 on Aloyco Hastelloy valves.

Name_____

Firm_____

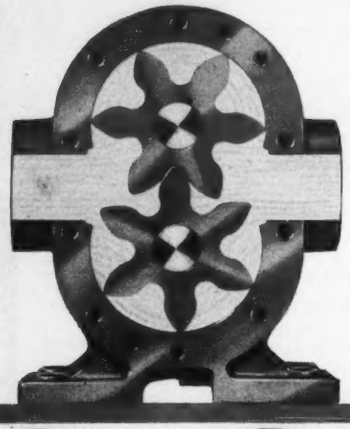
Address_____

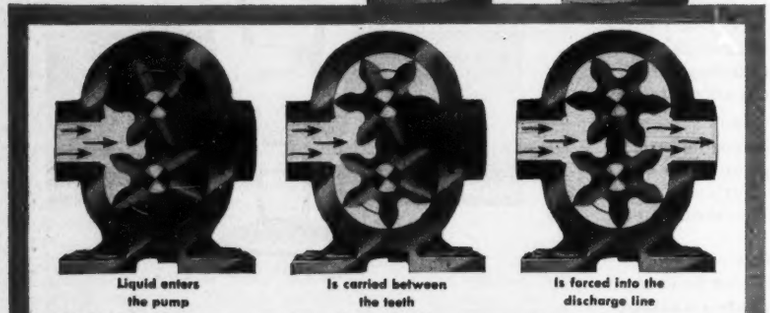
City_____ Zone____ State_____

When inquiring check CP 1576 opposite last page

IF
"THE PRINCIPLE OF THE THING"
MEANS ANYTHING TO YOU
then look to ROPER

only 2 moving parts
HELP MAKE ROPERS DEPENDABLE





**SMOOTH AND QUIET FLOW...
EQUAL EFFICIENCY IN EITHER DIRECTION**

HOW IT OPERATES — The unmeshing of the gears produces a vacuum, drawing the liquid into the tooth spaces. The liquid is carried between the teeth and case to the opposite side of the pump. The meshing of the gears forces the liquid into the discharge line. This is a positive displacement pump. The Roper principle is simple in design. It has only two moving parts — equal size pumping gears — operating in a case with proper amount of clearance to promote high efficiency and long life.

GEO. D. ROPER CORPORATION 750 Blackhawk Park Ave., Rockford, Ill.

Send for helpful handbook
"HOW TO SOLVE PUMPING PROBLEMS"
ROPER Rotary Pumps

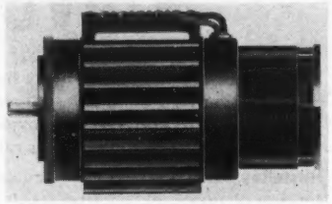
When inquiring check CP 1577 opposite last page

Tachometer generator integrally mounted with 35 w motor . . .

reduces back-lash to zero

Uses: Regulation of motor speeds, automatic controllers, or stabilizing closed-loop circuits.

Features: Motor and tachometer are mounted on a single shaft reducing back-lash to zero. Thirty-five watt motor component is believed to be first motor of its kind and rating to be integrally mounted with a tachometer generator.



Motor and tachometer are mounted on a single shaft

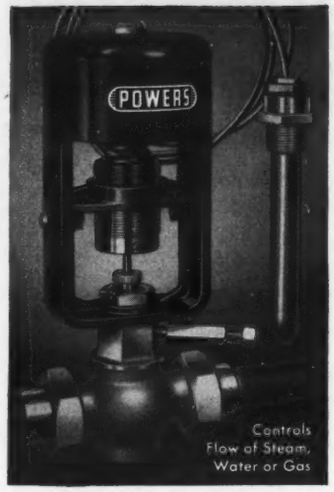
Description: Motor is rated for continuous duty at rated output and can be stalled continuously with one phase of motor excited at rated voltage and frequency. Tachometer generator can be excited with its rated voltage and frequency. Tachometer can be readily adjusted after installation.

(Servomotor-tachometer generator units are a product of Diehl Manufacturing Co., Dept. CP, Somerville, N. J. . . . or for more information check CP 1578 on handy form opposite last page.)

Outlines applications of firebrick

Specifications, applications, and quantity estimating of firebrick are featured in 28-page, two-color bulletin. Installations are graphically illustrated. Bul R-34 is issued by Refractories Div., Babcock and Wilcox Co., Dept. CP, 161 East 42nd St., New York 17, N.Y. When inquiring specify CP 1579 on handy form which is located opposite last page.

Hold That TEMPERATURE
at the *Right* point with a
POWERS
No. 11
Self-Operating REGULATOR



Simplest, Reliable Control made for water heaters, industrial processes, heat exchangers, air compressors.

BETTER CONTROL FEATURES

Powers bellows has 50% more power than used in majority of regulators. Durable 2-ply bellows outlast ordinary single-ply type. Valve stem lubricator with silicone grease aids easy movement of highly polished stainless steel valve stem and reduces drying out of packing. Better control results from Powers powerful bellows and minimum of valve stem friction. *Write for Bulletin 329.* (c38)

THE POWERS REGULATOR CO.
Skokie, Ill., • Offices in 60 Cities • See Your Phone Book
Over 60 Years of Automatic Temperature and Humidity Control

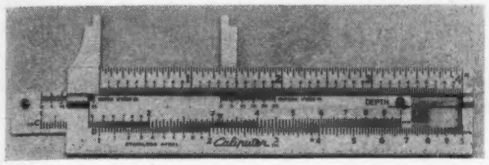
When inquiring check CP 1580 opposite last page

alphabetical index on page 255

. . . for alphabetical index of all processes, materials, services, and equipment discussed in this issue's editorial columns and advertisements, turn to page 255. "Quick-locator" starting on that page was a feature in CHEMICAL PROCESSING years ago. It means extra work for the Editors, but it helps you, the reader, in finding what you want . . . in a hurry!

Vernier caliper, depth gage, and slide rule all in one

Made of satin finish type 302 stainless, pocket-size device combines the functions of a vernier caliper, a depth gage, and a slide rule computer in a single unit. Unit provides direct readings of circumferences and cross-section areas as well as all multiplication, division, and square root calculations.



Unit provides direct readings of circumferences and cross-sectional areas

Readings of 4½ inch caliper and depth gage are accurate to one-thousandth of an inch and the linear scale is graduated to thirty-seconds of an inch. Instrument is precision-etched and measures 4½ inches long, 1½ inches wide, and 1/16 inch thick.

(Caliputer is a product of Jet Air Engineering Corp., Dept. CP, 367 Sixth Ave., San Diego 1, Calif. . . . or for more information check CP 1581 on handy form opposite last page.)

Specifications on flexible hose and expansion joints

Specifications on line of expansion joints and flexible metal hose are given in eight-page catalog. A number of different types of both items is described and illustrated.

Cat 149 is issued by Flexonics Corp., Dept. CP, 1319 S. Third Ave., Maywood, Ill. When inquiring about manufacturer's product reader may simply check CP 1582 on handy form which is located opposite last page.

1000 questions and answers on plant maintenance

Highlight of volume on plant maintenance is 1000 questions presented by 2400 executives and the answers given by 56 experts. Volume covers procedings of the 1955 annual conference held concurrently with the Plant Maintenance & Engineering Show. Twenty-three papers presented are included in text.

"Techniques of Plant Maintenance & Engineering—1955," may be obtained for $7.50 postpaid from Clapp & Poliak, Inc., Dept. CP, 341 Madison Ave., New York 17, N. Y.

The Steam Traps That Didn't Cost a Penny . . .

10% Fuel Savings Paid for These Armstrongs

"A ton a day coal saving"—When you can save 2000 to 3000 pounds of coal per day, it doesn't take long to completely pay for an Armstrong steam trap installation. That's the way it worked at Beloit Boxboard Co., Beloit, Wisconsin. Mr. Edward Kasten, Plant Engineer, is shown above pointing to a No. 812 Armstrong trap, list price $23. Every 3 or 4 days one of the traps pictured was paid for in full at the expense of the coal man. For a bonus, there had been absolutely no repair costs on these traps at the end of three years service.

Are such savings common?—More often than not, the replacement of leaky or obsolete or improperly sized steam traps with new Armstrongs results in worthwhile fuel savings. Some of the best engineered plants in the country have experienced this.

The reasons—Start with a good steam trap design. Add to it shop men who have made more industrial steam traps than any other group in the world. Then, add to that the best trained, most experienced trap sales-engineering group in existence. Season the whole affair with the Armstrong unconditional guarantee of "complete satisfaction or your money back". You can't buy any product anywhere with closer to 100% assurance that it is going to give you good results. In the case of steam traps, one of those results is often fuel savings.

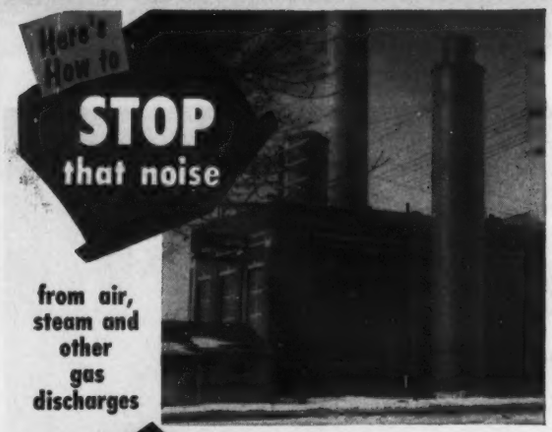
Why not take another good look at your trapping? Call your local Armstrong Factory Representative (listed in many classified phone directories and in Thomas Register), or write to Armstrong Machine Works, 880 Maple St., Three Rivers, Michigan.

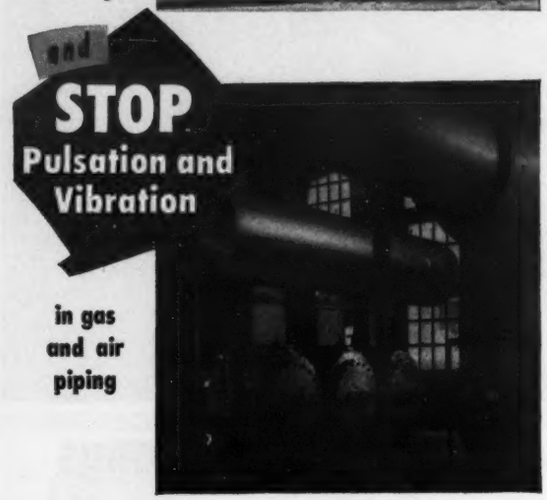
Application Engineered
ARMSTRONG STEAM TRAPS

ASK FOR CATALOG J
. . . the 44-page "Steam Trap Book" is really a handbook of steam trapping—trap data plus selection, installation and maintenance information. Free on request without obligation.

Armstrong traps also catalogued in Sweets and Chemical Engineering Catalog.

When inquiring check CP 1583 opposite last page





BURGESS-MANNING
SNUBBERS

— are engineered to effectively correct your specific noise or pulsation problem.

They are available in many different basic types for arresting intake and exhaust noises, some of which may integrally incorporate such additional features as air cleaning—or heat recovery—or spark arresting—or surge control—or water separating.

Others, which are primarily designed to stop line surges set up by compressors, pumps, blowers, etc., will effect noteworthy savings in piping, repairs and maintenance, and permit accurate flow readings.

There is no obligation for recommendations. Send us a description of your problem.

BURGESS-MANNING COMPANY
721 East Park Avenue, Libertyville, Illinois
Dallas, Texas

When inquiring check CP 1584 opposite last page

new literature

Industrial bulletins pertinent to the reader . . . offering data on products, processes, services

Presents information on high-boiling water-soluble ester for solvent use

Diethylene glycol monoethyl ether acetate, one of the few commercially available, high-boiling, water-soluble esters, is the subject of a four-page data bulletin. It is particularly useful in surface coatings where a strong, slow evaporating solvent is of primary importance.

Bul F-4811A "Carbitol Acetate" is issued by Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. When inquiring specify CP 1585 opposite last page.

Tells how pressure filter can speed filtrations

Advantages of closed-type pressure filter for minute filtration of liquids, chemicals, oils, and fats, are described in illustrated two-page bulletin. Filter features stainless steel, wire-wound cylinder which will support various filter media, prevent corrosion, and speedup filtrations. Bulletin outlines uses of filter and tells how unit can reduce maintenance and labor costs.

Bul HH 104 is issued by US Hoffman Machinery Corporation, Dept. CP, 105 Fourth Avenue, New York 3, New York. When inquiring specify CP 1586 opposite last page.

Covers variety of industrial heating equipment

Industrial heating equipment for chemical and other industrial processes is covered in 28-page catalog. Illustrated with photographs, charts, and drawings, catalog describes various kinds of air heaters, ovens, burners, electrical heaters, hot water generators, boilers, heat exchangers, and accessories.

"Industrial Heat" is issued by Beltran Associates Inc., Dept. CP, P. O. Box 128, Vanderveer Station, Brooklyn 10, New York. When inquiring specify CP 1587 opposite last page.

Describes electronic units for flow measurement

Using simplified schematics to explain mercuryless transmitters for flow measurement, 12-page bulletin in two colors includes photographs of the principal components of system. Primary elements can be thin plate orifices, orifice pipe assemblies or flow nozzles. Transmitter uses a metallic bellows for differential pressure measurement.

Pub 55-1074-222 is issued by The Hays Corp., Dept. CP, 742 E. 8th St., Michigan City 34, Indiana. When inquiring specify CP 1588 on handy form opposite last page.

Describes granular and powdered adsorbent activated carbons

Five data sheets detail uses, advantages, requirements, specifications, and characteristics of activated carbon in purification. A number of sizes and types of both extra-hard granular and powdered adsorbent carbons are included. The evaluation and illustration of methods of industrial application are included.

Bul #13 is available from Adsorbite Div., Barnebey-Cheney Co., Dept. CP, Cassady at E. 8th Ave., Columbus, Ohio. When inquiring check CP 1589 on handy form opposite last page.

Gives highly efficient method for making, handling brine

Lixate process for dissolving rock salt without agitation is described in 32-page booklet. Drawings of equipment and photographs of installations in many industries are given. Included are 15 pages of descriptive information on rock salt, brine, and test methods.

"Brine for Today's Industry" is issued by Industrial Div., International Salt Co., Inc., Dept. CP, Scranton Life Bldg., Scranton 2, Pa. When inquiring specify CP 1590 on handy form which is located opposite last page.

Polyethylene glycol monolaurate: low-foaming non-ionic

Non-ionic surface-active agent, Polyethylene Glycol 400 Monolaurate, used to wet pigments and to act as a grinding aid, overcomes problem of foaming during manufacture. Four-page bulletin points out it can be used to promote leveling, to emulsify additives to the paint (such as oils, plasticizers, resins), and to disperse pigments and color. Physical and chemical properties are tabulated.

Bul 115B is issued by Glyco Products Co., Inc., Dept. CP, Empire State Bldg., New York 1, N. Y. When inquiring specify CP 1591 on handy form opposite last page.

Data on drain traps, filters, lubricators, and regulators

Detailed data, photographs, and features of filters, lubricators, regulators, and drain traps are given in 18-page bulletin. Variety of types and sizes is shown.

"Filters, Lubricators, Regulators, and Drain Traps," is issued by Arrow Tools, Inc., Dept. CP, 1900 S. Kostner Ave., Chicago 23, Ill. When inquiring specify CP 1592 on handy form opposite last page.

Describes unit for driving centrifugal compressor

Engine-gear set for driving centrifugal compressors and high speed pumps is described in eight-page, illustrated bulletin. Bulletin describes how fuel costs can be cut by the use of this unit.

Bul 237 is issued by Nordberg Manufacturing Co., Dept. CP, Chase & Oklahoma Ave., Milwaukee 1, Wis. When inquiring specify CP 1593 on handy form opposite last page.

Safe load tables presented for steel grating

Fifteen-page, two-color bulletin gives safe load tables for welded and riveted steel grating in spans from two to nine feet. Specifications for steel stair treads, drain grates, and grating anchors are included. Two-page section deals with special grating for vessel lining and floor reinforcement.

File No. 14-P is issued by Klemp Metal Grating Corp. Dept. CP, 6601 South Melvina Ave., Chicago 38, Illinois. When inquiring specify CP 1594 on handy form opposite last page.

what is your **PULVERIZING** problem?

we'll test grind a sample for you

with the

SCHUTZ-O'NEILL

Superfine

PULVERIZER

What is your milling problem—uniformity? fineness? Do you need increased output at a lower cost? Without obligation to you, we'll grind a sample of your material in our pilot plant, using a production model Schutz-O'Neill "Superfine" Pulverizer. We'll return your processed product with our Engineering Test Report giving exact data and including recommended Schutz-O'Neill equipment, methods and mill plans for your job.

This will give you full information on the versatility, particle size range and capacity of Schutz-O'Neill "Superfine" Pulverizers. Backed by more than 60 years of continuous manufacturing and field experience.

SCHUTZ-O'NEILL PILOT PLANT uses a standard production model 16" Superfine Pulverizer. Mill components on wall at left in photo provide up to 100 different pulverizing setups, with a range from 40 mesh to 5 microns.

Below are two typical pulverizing problems that were solved by SCHUTZ-O'NEILL

NO. 1 PULVERIZING CERAMIC MOLDING MATERIALS

THE PROBLEM: To develop ceramic materials for precision molding of high temperature, high fidelity alloy castings for jet aircraft engines. Castings of molybdenum, columbium, and other rare metals were to be made. By producing precise castings, less machining is required and more rare metal saved. The particle size for best results (determined by university consultants) fell within the 60 to 200 mesh range.

THE TESTS: The Schutz-O'Neill pilot plant processed 200 pounds of the feed material, in a series of tests with the university ceramic consultants and the contracting firm present.

THE SOLUTION: Schutz-O'Neill designed a system that is now producing 1,000 to 1,200 pounds per hour of ceramic material 85 to 90 percent within the required 60 to 200 mesh range.

NO. 2 PIGMENTS UNDER 25 MICRONS FOR COLORING PLASTICS

THE PROBLEM: A leading chemical firm producing a variety of resins and plastics wanted to reduce and intimately blend pigments for coloring molded plastic forms. The manufacturer found that particles larger than 25 microns produced streaks in the finished molding. In addition, tints prepared from more than one color necessitated absolute dispersion and optimum blending to insure proper shading and depth.

THE TESTS: Pilot plant test runs were conducted at Schutz-O'Neill. The resulting product was analyzed in the manufacturer's lab. In their report to Schutz-O'Neill, the firm stated, "In all our tests your grinder was equal to or better than the others from the standpoint of fineness of grind and absence of pigment specks in our product".

THE SOLUTION: The chemical firm is being supplied with a 22" Schutz-O'Neill stainless steel Pulverizer.

Write Us:

Tell us the stock you want to pulverize, fineness, capacity desired; we'll send shipping instructions. Or, write for literature desired on Schutz-O'Neill Pulverizers, Granulators, Roller Mills, Sifters, Cyclone Collectors, Hammer Mills.

ESTABLISHED 1893

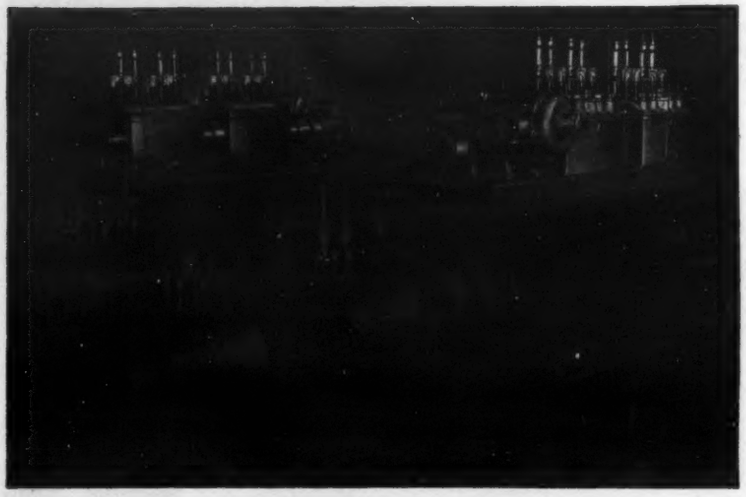
SCHUTZ-O'NEILL COMPANY

PULVERIZERS • GRANULATORS • ROLLER MILLS • CYCLONES • SIFTERS • HAMMER MILLS

343 PORTLAND AVENUE • MINNEAPOLIS 15, MINNESOTA

When inquiring check CP 1595 opposite last page

High Pressures HOLD NO TERROR FOR Manzel FORCE FEED LUBRICATORS!



Where dependable lubrication under high pressure is essential to the efficiency of such equipment as pumps and compressors, Manzel has the answer. Models are available for operation against discharge pressures of up to 30,000 P.S.I.G. Manzel thus offers the Chemical Industry the means of insuring maximum life of oil seals — and competent assistance in engineering special lubricator installations to meet specific needs. For Force Feed Lubricators — and Chemical Feeders, too, — put Manzel at the top of your list of those to call.

Professionally qualified engineering representatives throughout the country.

Manzel

DIVISION OF
HOUDAILLE-HERSHEY CORP.
274 BABCOCK ST., BUFFALO 10, N. Y.

When inquiring check CP 1596 opposite last page

NEW LITERATURE

Describes giant-size safety posters

Booklet describes and shows examples of safety banners 35 sq ft in size. Posters are printed in fast colors on heavy duck cloth. There are twelve posters, one for each month. Posters are shipped to the user on the 15th of the month preceding the scheduled month-of-use. Indoor and outdoor style posters are available.

Giant Poster Booklet is available from National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill. Specify CP 1597 opposite last page.

Discusses steel valve design, selection

Steel valve design, selection, maintenance, and repair is covered in 12-page technical data booklet. Printed to form part of a forthcoming catalog, technical section is being offered separately. Photographs, engineering drawings, and cut-aways are included.

"Valve Technical Data" is issued by Cooper Alloy Corporation, Dept. CP, 100 Bloy St., Hillside, N. J. When inquiring specify CP 1598 on handy form opposite last page.

Depicts chemical products

Divided into four sections, 36-page spiral-bound booklet describes aliphatic chemicals, aromatic chemicals, cellulose products, and inorganic chemicals available from manufacturer. Specs and other properties, general uses, and shipping information are given. Many high-quality photographs are included.

Product-guide catalog, 7th Ed, is issued by Eastman Chemical Products, Inc., Dept. CP, Kingsport, Tenn. When inquiring specify CP 1599 on handy form which is located opposite last page.

FREE BULLETIN tells

HOW to Solve high temperature THREAD PROBLEMS!

C-5 prevents Galling and Seizing of Studs at temps. up to 1800°F

- √ Prevents Stud Breakage
- √ Eliminates Pitting of Stainless Steel
- √ Reduces Torque
- √ Speeds Disassembly Time

C-5 FEL-PRO "HI-TEMP" ANTI-SEIZE THREAD COMPOUND

Fel-Pro's exclusive C-5 colloidal-copper formula "copper-plates" metal, prevents locking, galling and direct contact between thread assemblies even at 1800°F without breakdown! And C-5 is safe for all metals! Prevents galvanic pitting even where dissimilar metals are joined! Protects all threaded surfaces of bolts, plugs and studs, insuring their repeated re-use. WRITE TODAY FOR FREE BULLETIN! 83788

FELT PRODUCTS MFG. CO.
1515 Carroll Ave., Chicago 7, Ill.

When inquiring check CP 1600 opposite last page

Announcing...
MOLYKOTE MICROSIZE

The "finest" molybdenum disulfide lubricant available.

With average particle sizes of less than one micron, MOLYKOTE MICROSIZE has the physical ability to enter the smallest spaces between mating parts to fully exploit the basic lubricating features of MoS_2 at extreme bearing pressures and temperatures.
Economically, too, the covering ability of MOLYKOTE MICROSIZE is far superior to ordinary grades of molybdenum disulfide powder

"Information on MOLYKOTE appears in Sweet's Product Design File, 1955, Section C."

For more detailed information, write today for our Bulletin 104.

THE ALPHA CORPORATION
65 Harvard Ave. • Stamford, Conn.

When inquiring check CP 1601 opposite last page

Replaceable rubber inserts extend life of separator

Historical development, design, and operating characteristics of rubber-lined cyclone separator is discussed in illustrated eight-page brochure. Included are photographs of typical installations and line drawings of standard units. Replaceable rubber-molded inserts decrease wear and increase operating life of unit.

Bul 2503 is issued by Dorr-Oliver Incorporated, Dept. CP, Barry Place, Stamford, Conn. When inquiring specify CP 1602 on handy form opposite last page.

Chemically-resistant resin described

A hard synthetic resin based on caoutchouc hydrocarbon polymers or Polyprens imparts outstanding properties in field of paint and ink technology. Properties and compatibilities of the raw resin are given along with properties of the clear and pigmented film in an eight-page, digest-size technical bulletin. Resin is available as 100% solids; and 60% and 50% solids in mineral spirits.

"Alpex by Alkydol" is issued by Alkydol Laboratories, Inc., Dept. CP, 3242 S. Fiftieth Ave., Cicero 50, Illinois. When inquiring specify CP 1603 on handy form opposite last page.

Outlines electrical properties of Teflon terminals

Electrical properties of Teflon terminals are featured in eight-page, two-color booklet. Mechanical, chemical properties and applications are given for stand-offs, feed-thrus, and connectors. Specifications and installation procedure and included.

"Press-Fit" bulletin on Teflon terminals is issued by Sealectro Corp., Dept. CP, 186 Union Ave., New Rochelle, N. Y. When inquiring specify 1604 on handy form opposite last page.

Describes heat-sensitive paint — color changes at 400°F

Two-page booklet describes temperature-sensitive paint which undergoes color change from original mustard-yellow to maroon at 400°F.

Four-ounce sample and bul "Temp-Alarm° Paint" are available from Tempil° Corp. Dept. CP, 132 W. 22nd St., New York 11, N. Y. When inquiring specify CP 1605 on handy form oposite last page.

Here Is Extra Motor Value

This Allis-Chalmers Bearing Design Gives More for Your Motor Dollar

The bearing cap is held tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure.

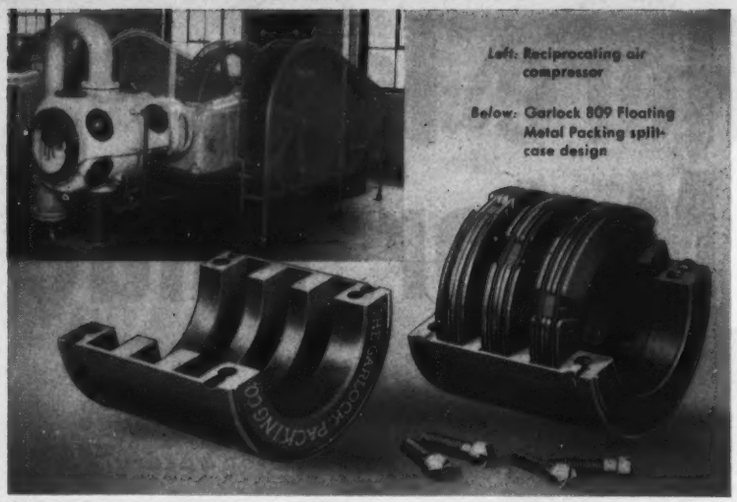
At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.

You can lubricate these bearings without dismantling motor. Pipe-tapped holes in the bearing housings at two points provide means for inserting new grease, flushing out old grease and of relieving pressure during re-greasing.

Look for the extra bolts on the end housing . . . the sign of greater value. Ask your Allis-Chalmers representative or Authorized Distributor to show you a cutaway section of this maintenance-cutting design. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7225. A-4616

ALLIS-CHALMERS

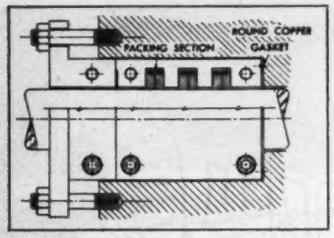
When inquiring check CP 1606 opposite last page



For air compressors, users report

GARLOCK SPLIT-CASE METAL PACKINGS

have 2 big advantages



1. **LONG, TROUBLE-FREE LIFE.** Minimum of 7 years with proper lubrication.

2. **CAN BE INSTALLED *WITHOUT* DISCONNECTING THE ROD.** Downtime is reduced to a minimum.

You can eliminate the cost of frequent packing replacements and unnecessary downtime by installing Garlock split-case metal packings on your reciprocating air compressors. Service reports show that these Garlock metal packings have given 15 years and more of trouble free service with a minimum of rod wear.

For complete information, call your Garlock representative or write today for Brochure 3889.

THE GARLOCK PACKING COMPANY, PALMYRA, N. Y.

Sales Offices and Warehouses: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, Los Angeles, New Orleans, New York City, Palmyra (N.Y.), Philadelphia, Pittsburgh, Portland (Ore.), Salt Lake City, San Francisco, St. Louis, Seattle, Spokane, Tulsa

In Canada: The Garlock Packing Company of Canada Ltd., Toronto, Ont.

GARLOCK

PACKINGS, GASKETS, OIL SEALS,
MECHANICAL SEALS, RUBBER EXPANSION JOINTS

When inquiring check CP 1607 opposite last page

NEW LITERATURE

Explains flow control for paper mills

Illustrating and describing how paper mill operators have solved low-capacity flow control problems, 14-page three-color bulletin includes 20 process diagrams. Booklet discusses dioxide, hypochlorite and per-pulp bleaching using chlorine oxide, or mixed peroxide.

Stock preparation and water treating, together with coating processes, are discussed and explained. Bulletin also includes list of technical papers and bulletins issued by the manufacturer.

Bul 455 is issued by the Milton Roy Company, Dept. CP, 1300 East Mermaid Lane, Philadelphia 18, Pa. When inquiring specify CP 1608 on handy form opposite last page.

Cites advantages of LP in lift trucks

Brochure outlines maintenance savings possible with liquefied-petroleum gas-fueled fork lift trucks.

Schematic drawings and photo diagrams are included.

LP-gas brochure is available from Towmotor Corp., Dept. CP, 1226 E. 152nd St., Cleveland 10, Ohio. When inquiring specify CP 1609 on handy form opposite last page.

Explains 250 kv X-ray for industrial use

Booklet of 12 pages explains 250 kv constant potential X-ray for studying internal structure of opaque material upon production basis.

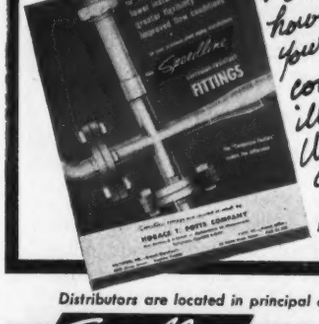
Bul XB 404-700 is issued by Westinghouse Electric Corp., Dept. CP, P.O. Box 2099, Pittsburgh 30, Pa. When inquiring specify CP 1610 on handy form opposite last page.

The NEW Standard in Pipeline Economy

Speedline® STAINLESS STEEL FITTINGS REDUCE INSTALLATION COSTS!

EXCLUSIVE TANGENTIAL FEATURE allows:

- More Clearance for Welding
- Flanging Without Welding
- Easier Alignment



✓ Complete details on how you can reduce your piping costs are contained in this illustrated catalog. Write for your copy today. NO OBLIGATION

® SPEEDLINE is a registered Horace T. Potts Co. trademark

Distributors are located in principal cities from coast to coast

Speedline® STAINLESS STEEL FITTINGS

manufactured by HORACE T. POTTS COMPANY
502 East Erie Avenue • Philadelphia 34, Pa.

When inquiring check CP 1611 opposite last page

WHEN IN NEED OF MATERIALS, PARTS OR EQUIPMENT . . . MAKE USE OF THE

42,293 ADVERTISEMENTS
PLACED BY
11,322 ADVERTISERS IN

THOMAS REGISTER

Your Where-to-Buy Encyclopedia

Thomas Publishing Company
461 Eighth Avenue, New York 1

When inquiring check CP 1612 opposite last page

Properties, equilibrium data, and recovery of furfural

Physical properties of pure furfural, QQ® Furfural specifications recovery from various systems, sp gr data, vapor pressure, temperature-composition diagrams, solution temperature and vapor-liquid equilibria data, and solubility information are presented in 16-page booklet. Three graphs, six tables and bibliography of ten references accompany text.

Bul #203-A is issued by Chemicals Dept., The Quaker Oats Co., Dept. CP, Merchandise Mart Plaza, Chicago 54, Ill. When inquiring check CP 1613 on handy form opposite last page.

Describes dimethyl itaconate, di-n-butyl itaconate

Nine-page technical data sheet covers dimethyl itaconate and di-n-butyl itaconate, two esters of fermentation-produced itaconic acid. Physical properties, vapor pressure, reactions, molecular structures, polymerization, toxicity, specs, and references are given. Uses suggested are: chemical intermediates, monomers to make plastics.

Bul 501 is issued by Chemical Sales Div., Chas. Pfizer & Co., Inc., Dept. CP, 630 Flushing Ave., Brooklyn 6, N.Y. When inquiring specify CP 1614 on handy form opposite last page.

Pictures packaged steam generators — 10,000 to 46,000 lb/hr

A series of packaged steam generators ranging in size from 10,000 to 46,000 lb steam per hour is described in 16-page catalog. Capacities, dimensions, construction features, instrumentation, accessories, sectional drawings, and installation photographs are given.

"Packaged Steam Generators," is issued by Foster Wheeler Corporation, Dept. CP, 165 Broadway, New York 6, N. Y. When inquiring specify CP 1615 on handy form opposite last page.

Illustrates mercury relay with ceramic plunger

Four-page bulletin describes ceramic plunger mercury relay. Contact ratings are 35 amps at 115v AC. Contacts will handle motor loads up to 2 hp.

Catalog 30 is issued by Philadelphia Scientific Glass Co., Dept. CP, 1866 Eckard Ave., Abington, Pa. When inquiring specify CP 1616 on handy form opposite last page.

Two more BAKER PERKINS continuous-mixing KO-KNEADERS
(LIST SYSTEM)
now on the job

MODEL K-
30 H.P. DRIVE MO

A switch from the batch process to continuous is now possible in many mixing, blending, and kneading operations, by use of these new Baker Perkins Ko-Kneaders. The two models shown here are both for Kneading heavy masses . . . chemicals, margarine, soaps, rubber, and plastics such as polystyrene, PVC, polyethylene, or acetate. They can be used to disperse colors in a vehicle, as well as countless other mixing and kneading applications.

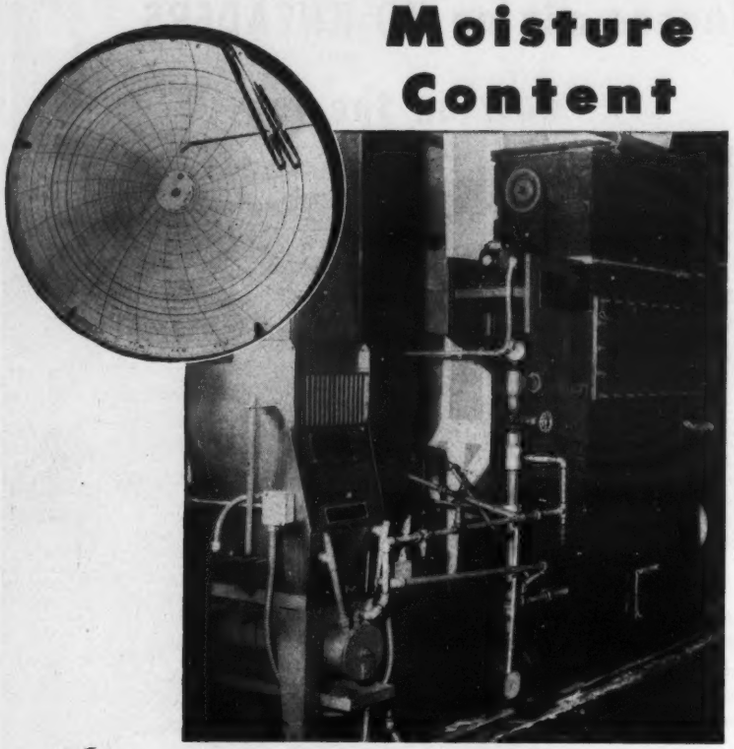
DEL K-300-1M
40 H.P. DRIVE MOTOR

In many phases of the chemical industry the mixing process has been a bottleneck because it was a batch operation. The Baker Perkins Ko-Kneaders break this bottleneck by converting to continuous mixing. When installed with the proper feeding and output handling equipment, these Ko-Kneaders make mixing largely automatic, and result in a better quality product along with savings in production costs.

BAKER PERKINS INC. 303
CHEMICAL MACHINERY DIVISION · SAGINAW, MICHIGAN

When inquiring check CP 1617 opposite last page.

EXACT CONTROL of Moisture Content



. . . To Improve Your Product or Protect Your Materials or for Processes or Tests

● This Niagara Air Conditioning Method dries air directly and measurably, using a moisture-absorbing liquid spray. It makes humidity control a separate function from lowering or raising temperatures and gives you precise control with thermostats alone; no moisture-sensitive devices are needed. You have simpler, more trustworthy, less expensive control instrumentation. Niagara precise-control installations have the best record for reliability.

Niagara Air Conditioning provides you with any temperature and relative humidity you need. Using "Hygrol" absorbent, it is not expensive to operate, saving the refrigeration commonly used to condense moisture and making re-heat unnecessary in most cases. It gives large capacity with compact, easily-maintained equipment. Ask for Descriptive Bulletins #112 and #121. Address Dept. CP.

NIAGARA BLOWER COMPANY

405 Lexington Ave. New York 17, N. Y.

District Engineers in Principal Cities of U. S. and Canada

When inquiring check CP 1618 opposite last page

NEW LITERATURE

Estimate grout requirements with handy card

Handy, pocket-size card aids in estimating grout requirements of heavy equipment, machinery, anchor bolts, building columns, and bridge seats. Data is based on company's pre-mixed grout, a ready-to-use, non-shrink grouting material that requires only mixing with water at job site.

Data card EPMG-4 is available from The Master Builders Company, Subsidiary of American-Marietta Co., Dept. CP, 7016 Euclid Avenue, Cleveland 3, Ohio. When inquiring specify CP 1619 on handy form, opposite last page.

Protect threaded parts, pipe, tube ends

Caps and plugs used as protective closures for sealing or masking of tubing, fittings, valves, hydraulic components, and machined parts are described in four-page catalog. Sizes and specifications of closures available are listed. Dimensional information covers five types of rubber and two types of plastic caps and plugs.

Cat 55-1 is available from Ray A. Scharer and Company, Dept. CP, 3000 East Grand Blvd., Detroit 2, Michigan. When inquiring specify CP 1620 on handy form opposite last page.

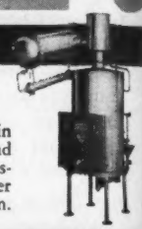
Describes dynamometer for "lab standard"

Four-page bulletin describes "laboratory standard" dynamometer with accuracy of 0.1 of 1%. Instrument is for use at 50 to 500 cps.

"Electrical Measurement" is issued by Sensitive Research Instrument Corp., Dept. CP, 9-11 Elm Avenue, Mt. Vernon, N.Y. When inquiring specify CP 1621 on handy form opposite last page.

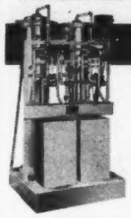
SALE!

DISTILLED WATER



only ½¢ per gallon

Put a Barnstead Pure Water Still to work in your plant or laboratory. Since 1878 Barnstead equipment has been producing the purest distilled water — and at the lowest cost, too! Over 200 different sizes and models to choose from.



DEMINERALIZED WATER

only 5¢ per 1000 gallons

Barnstead Demineralizers in capacities of 5 to 3000 G.P.H. effectively remove ionizable impurities, making low-cost demineralized water available for countless manufacturing, processing, and laboratory operations.

More than 60,000 Barnstead Stills and Demineralizers now in use in every country . . . in every industry. Write for accurate, impartial answers to your Pure Water Problems.

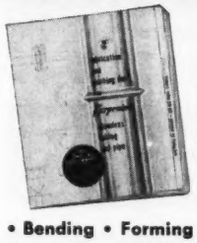
New York Office KIngsbridge 8-1557

Barnstead STILL & STERILIZER CO.

66 Lanesville Terrace, Forest Hills, Boston 31, Mass.

When inquiring check CP 1622 opposite last page

NEW...helpful data



A guide to fabricating stainless tubing and pipe

Here's the last word on shop-proved methods of fabricating and working stainless tubing and pipe. Described and illustrated are these eleven different operations:

• Bending • Forming • Expanding • Beading, Flaring and Flanging • Spinning • Welding • Soldering • Mechanical Joining • Cutting, Machining and Threading • Annealing and Pickling • Finishing and Grinding

A copy is yours for the asking. Send the coupon today.

Gentlemen:

Send me your Bulletin T.D. 114 on fabrication of stainless tubing and pipe.

NAME_____

FIRM NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

THE CARPENTER STEEL COMPANY

Alloy Tube Division, Union, New Jersey

When inquiring check CP 1623 opposite last page

Two data sheets cover oleates for paints

Diethylene glycol oleate, Witco DGO, is the subject of single-page data sheet. Main use: emulsifier in latex and resin emulsion paints.

Glycerol mono oleate, Witco GMO, is a dispersant or "solubilizer" for alkyd resins in "odorless" solvents. It is also a viscosity modifier. Typical properties are presented on second single-page data sheet.

Buls H-3 and H-4 are issued by Witco Chemical Co., Dept. CP, 122 E. 42nd St., New York 17, N.Y. When inquiring specify CP 1624 on handy form opposite last page.

Gearing selection and design treatise presented

Selection and design of gearing for use on mills, kilns, and hoists is discussed in 23-page, two-color engineering report. It contains information of practical importance to operating and management men in companies that employ this equipment in their processing operations. Report outlines gear types, loading, and sources of failure with liberal use of line drawings and photographs.

Engineering report 6170 is issued by Dept. 255 Falk Corp., Dept. CP, 3001 W. Canal St., Milwaukee 8, Wis. Specify CP 1625 opp. last page.

Points out extended life of insulation

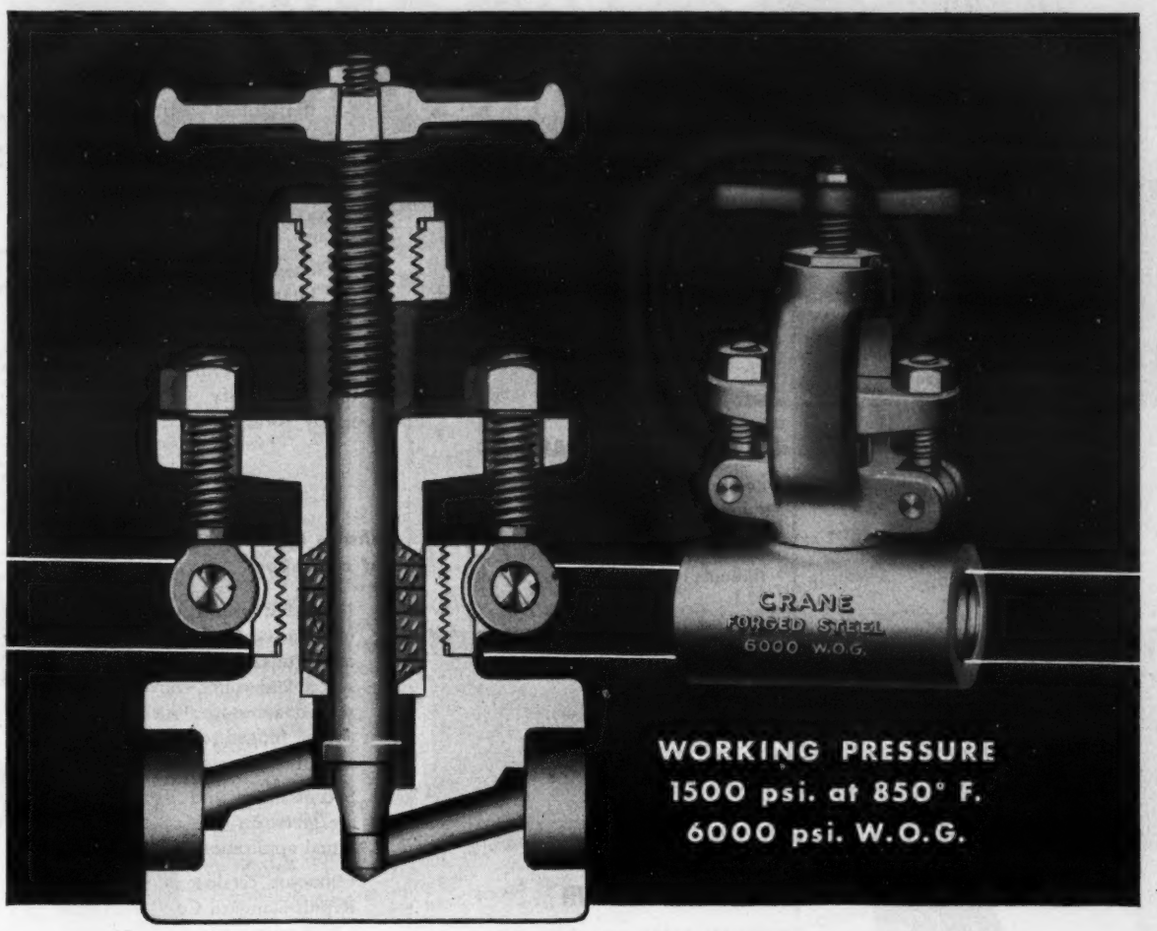
Twelve-page, two-color booklet discusses properties of polyester-mica insulation which gives extended life in hard service. Photos illustrate manufacture, installation, and testing. A brief story on how the insulation was developed is also included.

Booklet B-6506 is issued by Westinghouse Electric Corp., Dept. CP, PO Box 2099, Pittsburgh 30, Pa. When inquiring specify CP 1626 on handy form opposite last page.

Filters for compressed air and gases covered

Eight-page bulletin covers operation of filters used for compressed air and gases. Filters use a porous stone element which is unaffected by oil or moisture. Bul 117 is issued by R. P. Adams Co., Inc., Dept. CP, 225 E. Park Drive, Buffalo 17, N.Y. When inquiring specify CP 1627 on handy form opposite last page.

Now Available



New Crane Forged Steel Instrument Valves

Been looking for an exceptionally rugged, compact, and low-priced stop valve for your small hydraulic or high-pressure, high-temperature instrument lines?

Crane has developed it—sizes ¼", ⅜" and ½", in both screwed and socket-welded patterns. It's the all-new Crane Forged Steel Instrument Valve, and you can specify it now for immediate delivery.

Will Handle Many Services

Note closely the over-all design and construction shown above of this new Crane valve. Oversized stuffing box—heavy-duty Crane Exelloy stem with integral disc—bolted gland—swinging gland eye bolts—outside screw and yoke construction—all add up to the high performance and low maintenance you want in a valve for your instrument panels, orifice meters, bypass and gauge lines, regulator leads, and other hydraulic and high pressure/temperature lines.

Literature on Request

These rugged, low-cost stop valves are built for 1500 psi. at 850° and 6000 psi. W.O.G. Construction and materials are job-engineered by Crane experts—backed by a century of quality manufacturing, matchless experience. You'll want complete information on the all-new Crane Forged Steel Instrument Valves. Contact your Crane Representative, or write to Crane Co., General offices, Chicago 5, Illinois—Branches and Wholesalers serving all industrial areas.

for the THRIFTY BUYER

CRANE CO.

VALVES • FITTINGS • PIPE
KITCHENS • PLUMBING • HEATING

CRANE'S FIRST CENTURY...1855-1955

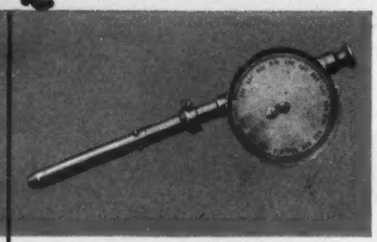
When inquiring check CP 1628 opposite last page

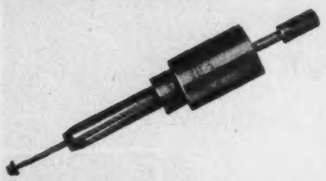
For better small tube maintenance

ELLIOTT TUBE CLEANERS and EXPANDERS

NEW ELLIOTT TUBE GAGE

Measures inside tube diameters in .001". A quick, guide for setting tube expanders for condenser and heat exchanger tubes. Three point contact of hardened steel balls insures accurate measurements.



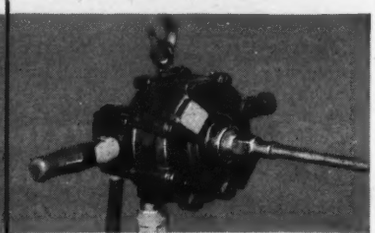


ELLIOTT TUBE EXPANDERS

Roll condenser and heat exchanger tubes quickly and accurately. Rotating, parallel self-feeding rolls insure good joints. For tubes ½ in. through 1½ in.

ELLIOTT CONDENSER CLEANER

Direct-drive air-driven cleaner using shaft and drill heads. Motor supported outside the tube by overhead pipe. Also available with electric motor.



ELLIOTT JIFFY GUN

Shoots nylon or rubber plugs through small tubes for rapid cleaning. Operated by inserting nozzle into tube end and pushing.

ELLIOTT 600 Series Cleaners

For straight and curved small tubes. Air or steam driven motors. Can be equipped with expanding brushes and scraper heads.

Y4-16

Write for Descriptive Bulletin Y-38

Address Elliott Company, Lagonda Division, Springfield, Ohio

ELLIOTT Company

STEAM TURBINES • MOTORS • GENERATORS • DEAERATING HEATERS • EJECTORS • CONDENSERS • CENTRIFUGAL COMPRESSORS • TURBOCHARGERS • TUBE CLEANERS • STRAINERS

When inquiring check CP 1629 opposite last page

NEW LITERATURE

Titanium machining recommendations

Bulletin of eight pages contains machining recommendations for titanium and titanium alloys. Recommendations are based on basic machining data accumulated through fabrication experience and research studies.

"Machining Recommendations for Titanium" is issued by The Mallory-Sharon Titanium Corp., Dept. CP, Lock Box 269, Niles, Ohio. When inquiring specify CP 1630 on handy form opposite last page.

Shows complete line of conveyors

Illustrated 16-page catalog shows manufacturer's line of conveying equipment, includes gravity wheel and roller conveyors and related accessories such as spur curves, hinged sections, diverters and aluminum sections.

Specifications and general data are given on each conveyor and actual applications presented.

Conveyor catalog is issued by Rapids-Standard Co., Inc., Dept. CP, Rapistan Bldg., Grand Rapids 2, Mich. Specify CP 1631 opposite last page.

Describes 20 patents held by AEC

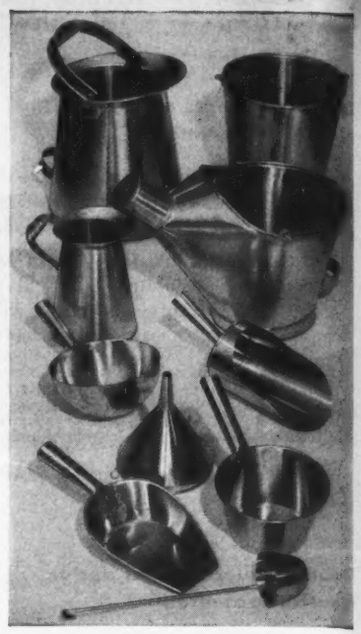
Descriptions of 20 patents owned by US Government and held by the Atomic Energy Commission are listed in eight-page report. As part of program to make non-secret technological information available to industry, use of patents is being offered on non-exclusive, royalty-free basis.

AEC patent listing is available from Chief, Patent Branch, Office of the General Counsel, US Atomic Energy Commission, Washington 25, D. C.

VALUE!

Your first order will convince you!

"Metalsmiths" Stainless Steel and Monel Utensils



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We've shipped "Metalsmith's" corrosion-resistant utensils all over the world for more than 30 years, with utmost satisfaction. Highest quality materials and workmanship assure long wear. All items shown, plus beakers, stock pots, batch cans and shovels, in stock. Buy, try, compare!

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METALSMITHS

Division of **Orange Roller Bearing Co., Inc.**

556 White Street Orange, N. J.

When inquiring check CP 1632 opposite last page

—to many

BAG CLOSING *problems!*

SEND for this new BULLETIN No. 201 which illustrates and explains how *Union Special Suspended Head Bag Closing Machines* can supply the answer to bag closing problems in small plants and large operations. Don't handicap your production with equipment that has limited capacity!

Union Special Bag Closers are designed to handle bags of heavy weight as well as light weight materials. These units are portable. Delivered to you complete with integral motor, thumb controlled clutch, automatic brake—ready to hang up, plug in, and go to work.

Send for this new Bulletin No. 201 NOW!

Union Special MACHINE COMPANY

442 N. Franklin Street • Chicago 10, Illinois

When inquiring check CP 1633 opposite last page

Emphasizes reduced maintenance with vertical motor

Multi-colored, 12-page publication emphasizes reduced maintenance costs and simplified lubrication of vertical motor. Unit is of the shielded, hollow-shaft, high-thrust type, ranging from 7½ to 500 hp.

Bul GEA-6280 is available from General Electric Co., Dept. CP, One River Rd., Schenectady 5, N. Y. When inquiring specify CP 1634 on handy form opposite last page.

Lists essential information on air release valves

Information on essential requirements, methods of installation, operation, and construction of automatic air release valve are covered in eight-page bulletin. Valve described is a small unit which functions by automatically releasing air accumulations from systems and pipe lines operating under pressure.

Bul 1204 is issued by Simplex Valve & Meter Company, Dept. CP, 7 E. Orange St., Lancaster, Pa. When inquiring specify CP 1635 on handy form opposite last page.

Gradiation heating for petroleum and chemical processing

Advantages and applications of gradiation heaters in petroleum and chemical processing operations are illustrated and described in 16-page bulletin. Photographs and descriptions of a number of typical installations are given.

Bul S-1043 is issued by Selas Corp. of America, Dept. CP, 548 Erie Ave., Philadelphia 34, Pa. When inquiring specify CP 1636 on handy form opposite last page.

Folder explains features of tachometers

Simplified operation and ease of installation of stationary centrifugal tachometers are described in four-page folder. Units described can be quickly installed on motors, conveyors, and other machines to check and show proper speeds for maintaining optimum performance.

"Stationary Tachometers," is issued by Boulin Instrument Corp., Dept. CP, 65 Madison Ave., New York 16, N. Y. When inquiring simply specify CP 1637 opposite last page.

SWIFT'S RED OILS INVITE COMPARISON!

Characteristics	Oleic Acid No. 905	Red Oil No. 805	Red Oil No. 810	Saponification Grade Red Oil
Titer (°C)	5 Max.	5 Max.	8-10	18 Max.
FAC		7 Max.	7 Max.	21 Max.
Color (Lovibond 1¼" Col.)		30 Y/3 R. Max.	30 Y/3 R. Max.	
(Lovibond 5¼" Col.)	10 Y/1 R. Max.			
FFA (As Oleic)	98-102%	97-101%	97-101%	95% Min.
Acid No.	195-204	193-202	193-202	190 Min.
Iodine No.	90-96	88-95	88-93	83-90
Saponification No.	198-204	194-204	194-204	193-203
Unsaponifiable	1.0% Max.	3% Max.	2.5% Max.	3% Max.

✔Not too long ago, Red Oils, like many staple industrial materials, were ordered simply as red oils . . . one or two grades served a wide range of needs. Specifications were of a broad and flexible nature.

Today, to meet the competitive needs of modern industry, Swift & Co. has developed four standard grades of Red Oil.

Check the specifications above and see which product fits your requirements. Because of their *exceptionally good color and color stability* many have found they could use Red Oil No. 805 and No. 810 in place of premium priced products, and here's why:

Made from the finest raw materials available, Swift's Red Oils are produced under highly controlled conditions. A unique low temperature solvent process permits the *selective* extraction of color bodies and other impurities. The manufacturing control made possible by such a process is your assurance of a reliable source for a wide variety of "application pure" Red Oil products.

Yes, for obscure as well as for common application, Swift's Red Oils *invite* comparison. So, next time you buy, don't order Red Oil . . . specify *Swift's* in the grade tailored to your needs. Write for a trial order at quantity price.

✔Write for new 8 page folder on Swift's Industrial Oil Products

Oleic Acid (Red Oil) • Animal Fatty Acids • Vegetable Fatty Acids • Stearic Acids • Hydrogenated Fatty Acids • Larex (Swift's Lard Oils) • Neatex (Swift's Neat's-foot Oils) • Swift's Sperm Oils • Spermaceti U.S.P. • Monoglycerides • Sulfonated Oils • Textile Processing Oils • Anti-Foam Agents • Glycerine • Tallows • Palmex (for Steel Mills) • Hydrogenated Glycerides.

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Company _____
Address _____
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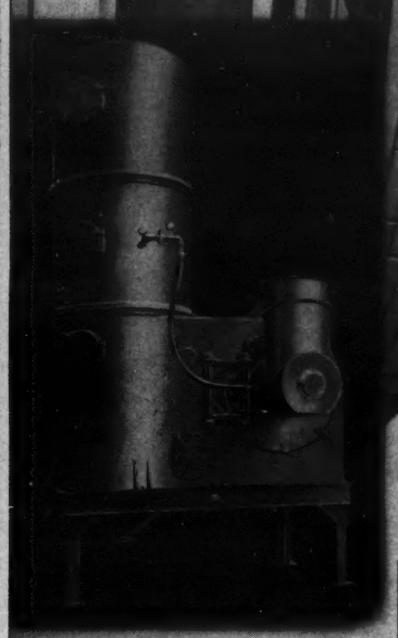
When inquiring check CP 1638 opposite last page

carbon black can put you in the red

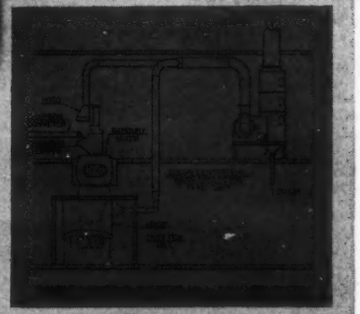
. . . Whether you manufacture automobile tires or rubber grommets . . . for that matter, if you work with any substance which produces a particularly stubborn dust . . . Ducon Dynamic Centrifugal Wash Collectors provide the highest efficiency obtainable in wet type collectors.

You can effectively control problem dusts and reclaim valuable fines with the DUCON UW-3 "package unit", combining exhauster and precipitator. Employing two-phased washing, it has successfully handled such difficult dusts as carbon black, pigments and other extremely fine dusts . . . at better than 99% efficiency.

Unit construction of this Ducon Collector simplifies installation and maintenance with almost any type of exhaust system. Prove to yourself that proper dust control can make a difference in production economies.



Complete assembly of the Type UW-3 Ducon Centrifugal Wash Collector.



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THE Ducon COMPANY

147 EAST SECOND STREET, MINEOLA, N.Y. • Sales Representatives in Principal Cities

Designers and Manufacturers of Dust Control Equipment Exclusively

CYCLONES • CENTRIFUGAL WASH COLLECTORS • TUBULAR CLOTH FILTERS • DUST VALVES

When inquiring check CP 1639 opposite last page

NEW LITERATURE

Tells how to select correct lift truck

Industrial equipment analysis guide and rating table similar to job and personnel rating techniques has been introduced by lift truck manufacturer for comparison and selection of fork lift trucks.

Thirty-six lift truck features are listed for comparison under following headings: performance, ease of operation, durability, serviceability and appearance. User self-rates each feature in points determined from general ideal rating and from user's own job requirements.

As many as four trucks can be analyzed and compared on chart. For use with chart, an analysis guide is provided to assist in comparing job requirements with truck features.

Forms 1406 and 1411 are issued by Hyster Co., Dept. CP, 2902 N. E. Clackamas St., Portland 8, Oregon. When inquiring specify CP 1640 on handy form which is located opposite last page.

Adipic acid

Although long used in making nylon, adipic acid finds other applications in plasticizers, surface-active agents, waxes, paper finishes, insect repellents, textile chemicals, resins, and coating compositions.

A detailed 36-page technical bulletin gives properties, specs, toxicity, shipping information, and general chemistry and reactions of the acid. Twenty-three pages are devoted to 79 descriptions of reactions and end products described in patent and reference literature.

Bul O-105 is issued by Organic Chemicals Div., Monsanto Chemical Co., Dept. CP, 800 N. Twelfth St., St. Louis 1, Mo. When inquiring specify CP 1641 on handy form opposite last page.

DRIBBLING IN BASKETBALL IS *OK*...

BUT NOT IN A CHEMICAL PLANT

A good dribbler may be worth his weight in gold . . . in basketball, but in your plant, dribbling expensive granular fines through poor fitting bucket lips can result in costly contamination.

Blaw-Knox Chemical and Fertilizer Buckets are designed with *tight-fitting* lips to prevent leakage. They stop the dribbling away of your profits. These cast alloy steel lips also resist abrasion and prolong bucket life.

For a detailed description of the important features in Blaw-Knox Buckets, write for Bulletin 2378 today.

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BLAW-KNOX COMPANY
Blaw-Knox Equipment Division
Department 761
Pittsburgh 38, Pa.
Offices in Principal Cities

When inquiring check CP 1642 opposite last page

Loosens FROZEN PARTS FAST!

Handy
Won't Leak
Shoots 3 Feet

Same formula as famous Kroil that has pleased 14,000 industrial users for 10 years or more.

Loosens stuck together metal parts, bushings, bearings, bolts, screws, pipe, etc., "anything from an embalmer's needle to a bulldozer," one customer said.

"Like an extra employee," said another. "Turned rust into mush, put $50,000 equipment back to work."

You too can get these results. *Try Aerokroil at our risk. Send $2 cash, and we'll pay postage.*

KANO LABS 1051 S. Thompson Lane Nashville 11, Tennessee

12-OZ. CAN $2, F.O.B. NASHVILLE
CASE OF 12 $18.75

When inquiring check CP 1643 opposite last page

Dictionary of steel terms and engineering data

Definitions frequently used in the purchase, manufacture, treating, machining, and finishing of steel are presented in 32-page dictionary. Also included are photos, curves, and tables giving engineering data on standard grain sizes for steels, iron-iron carbide equilibrium diagram, method of determining hardenability, and approximate hardness conversion numbers based on Brinell.

"Simplified Steel Terms and Engineering Data" is issued by LaSalle Steel Co., Dept. CP, 1412-150th Street, Hammond, Indiana. When inquiring specify CP 1644 opposite last page.

Thiazole accelerators in rubber products

Chemical and physical properties of MBT and MBTS accelerators for rubber products are presented in 32-page technical bulletin. Typical results obtained with these compounds in stocks compounded with natural rubber, GR-S, GR-A, and GR-I are given.

Tech Bul No. 839 is issued by Intermediate & Rubber Chemicals Dept., American Cyanamid Co., Bound Brook, N.J. When inquiring specify CP 1645 on handy form opposite last page.

Valve features four O-ring seals

Three-color, four-page booklet with cutaway views, describes standard and high-pressure ball valves. Four O-rings seal valves at stuffing box, bonnet stem, and seat. Valves are available in sizes from ½ to 2″ on standard model and ½ to 1″ on high-pressure model.

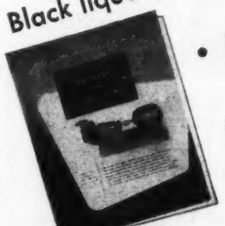
Bulletin on Carpenter Ball Valves is issued by Carpenter Valves Corp., Dept. CP, 6723 Denison Ave., Cleveland 2, Ohio. When inquiring specify CP 1646 opposite last page.

Metal cloth for filtering, straining, screening

Four-page bulletin describes metal cloth that can be used for filtering, straining, and screening. Photographs and information are given on several different types of the cloth.

Bul 551 is issued by Multi-Metal Wire Cloth Co., Inc., Dept. CP, 1350 Garrison Ave., New York 59, N. Y. Specify CP 1647 opposite last page.

• Calcium chloride brine • Flushing liquor • Sodium sulphate • Asbestos fiber & cement mix • Green liquor • Soap solution • Grinder coolant • Carbon slurry • Cane wash • Salt brine • Sea water • Caustic solution • Bleach liquor • Grape juice concentrate • Tomato juice concentrate • Tomato puree • Propanol • Soap liquor • Cane juice • Aqueous lime • Coke oven oil • Paper stock • Waste sulphite liquor • Alkylaryl sulfonate • Sugar liquor • Vinyl pyridine • Saturated brine • Grape juice • Tomato juice • Press liquor • Calcium bisulphite • Melt Phenolized ammonia • Ammonia liquor • Sulphuric acid • Paraffine oil and water • Sludge • Milk waste • Gritty water • Cane syrup • Lime & soda solution • Cachaza • Clear juice White water • Mineral oil • Chromic acid Cement • Gasoline • Depanol Brine • Vegetable oil • Licorice liquor • Flume water • River water • Benzine thinner • Mash Methylene chloride • Sodium hydroxide Sizing solution • Alcohol • • Steep soda • Caustic soda Black liquor • Ethylene glycol • Fuel oil • Furfural • Condensate •



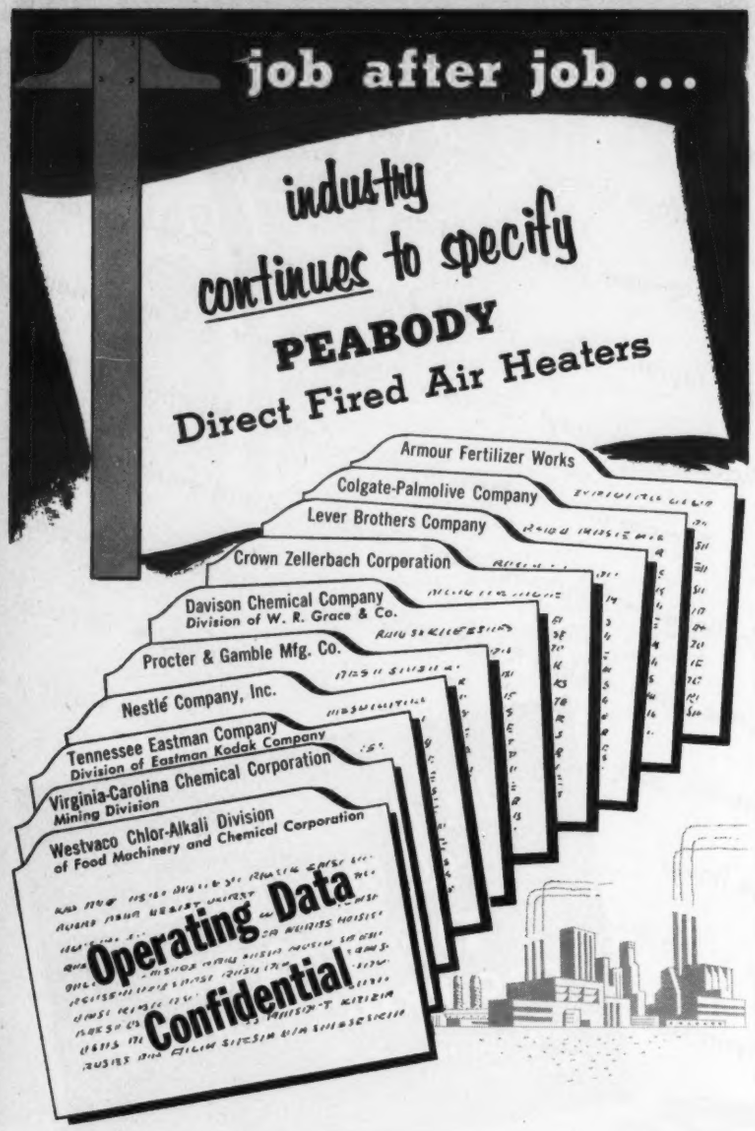
WRITE FOR BULLETIN 1125-B

DE LAVAL *Centrifugal Pumps*

DE LAVAL STEAM TURBINE COMPANY

889 Nottingham Way, Trenton 2, New Jersey

DL 261



• Peabody Direct Fired Air Heaters are so adaptable, effective and efficient, that they're continually specified and used where high-temperature air, above or below atmospheric pressure, is required for intricate processing problems. With a particular air heater, outlet temperatures and firing rates can be varied and controlled either manually or automatically. Variations in firing rate and air flow of 5 to 1 *(and even greater)* are easily attained. Heaters may be fired vertically up, vertically down, or horizontally, as desired. Low pressure loss — a few inches of water — cuts power waste *and* — there's no high pressure blower needed with a Peabody Direct Fired Air Heater. For full details write for Bulletin 600A.

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580 FIFTH AVENUE, NEW YORK 36, N.Y.
OFFICES IN PRINCIPAL CITIES
PEABODY LIMITED • LONDON, S.W. 1, ENGLAND

S-092-1

When inquiring check CP 1648 opposite last page

NEW LITERATURE

Tells how to select flexible metal hose

Included in 12-page, illustrated catalog is an easy four-step guide for selection of proper flexible metal hose to meet requirements. Line of company's corrugated metal hose, convoluted hose, stainless steel flexible metal hose, and other special-purpose assemblies are also covered.

Cat 147 is available from Flexonics Corporation, Dept. CP, 1318 South 3rd Avenue, Maywood, Illinois. When inquiring specify CP 1649 on handy form opposite last page.

Describes AC-operated pH indicator

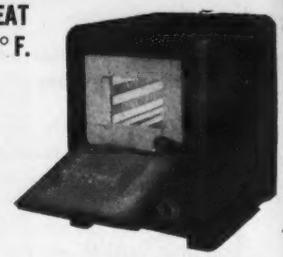
Using a simplified schematic diagram, four-page data sheet describes AC-operated pH indicator. Circuit described employs DC to AC conversion, AC amplification and conversion back to DC for voltage feedback. A full description is given as to how the indicator can be used for pH and redox work, Karl Fischer titrations, and other dead-stop end-point measurements in both laboratory and plant.

Data Sheet E-96(2) is issued by Leeds & Northrup Co., Dept. CP, 4934 Stenton Ave., Philadelphia 44, Pa. Specify CP 1650 opposite last page.

Butyl carbitol

Technical data sheet of four pages describes butyl carbitol, a low-evaporating solvent for nitro-cellulose and many resins. Five tables and eleven references are included in Bul F-8636 issued by Carbide & Carbon Chemicals Co., a Div. of Union Carbide Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. Specify CP 1651 opposite last page.

TRENT MUFFLE FURNACES FOR THE "LAB"
UNIFORM, CONTROLLED HEAT
for temperatures UP TO 2300° F.



Only Trent Muffle Furnaces feature Trent "Folded-and-Formed" Heating Units—the unique heating unit design utilizing ribbon type resistor element Folded and Formed to give you maximum controlled heat radiation and uniformity . . . plus maximum physical rigidity for longer furnace unit life! Engineered for maximum operating temperatures of 2000° F. or 2300° F., Trent Muffle Furnaces assure faster, more efficient heating at reduced power consumption for chemical processing, enameling, ash determination, fusions and countless heat treating operations.

- Streamlined Design eliminates asbestos millboard and transite fronts
- Welded Construction features outer steel casing lined with laminated layers of high grade brick and slab insulation
- Heating Elements on all four sides of furnace chamber
- Hearth Plate of rugged ceramic, silicon carbide construction
- Fast Action Door—overlapping and plug type
- Built-in Controls: percentage input timer, pyrometer, on/off switch, pilot light, gold fuse

TRENT MUFFLE FURNACES NOW IN TWO NEW SIZES TO MEET YOUR OPERATING REQUIREMENTS

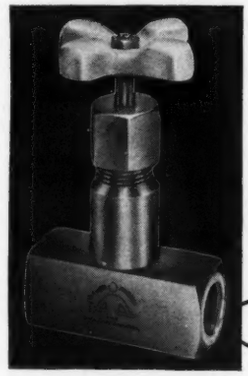
Model HL-4—8½" x 5¼" x 16¼" deep; 4 KW, 230 volts, single phase, 60 cycle operation

Model HL-6—11¼" x 8¼" x 24" deep; 10 KW, 230 volts, single phase, 60 cycle operation

Let an experienced Trent industrial heating engineer show you how you can improve your heating and processing operations with a Trent Muffle Furnace. And ask him to show you the new Trent "Folded-and-Formed" Heating Element booklet which describes the advantages of Trent installations for solving your industrial heating problems.

TREN INC. Electrically Heated Industrial Equipment
242 LEVERINGTON AVE., PHILA. 27, PA.
In Canada Supreme Power Supplies Limited Toronto 14

When inquiring check CP 1652 opposite last page

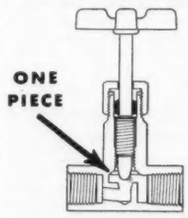


New **MARSH** *Needle Valves*

MAXIMUM WORKING PRESSURE 10,000 PSI

. . . for finer regulation of water, oil or gas

First needle valve to combine all the characteristics called for in modern industry. Embodies sturdiest basic construction—machined from solid bar stock—suitable for pressures to 10,000 psi and equally efficient in lower range. Note stem guide fused to body by new "Conoweld" process, eliminating faults of conventional two-piece valves. Stem 416 stainless steel. Stem threads fine pitch for strength and micrometer regulation. Body electro-zinc plated. Sizes ⅛" to 1", globe and angle patterns.



Ask for new Needle Valve Catalog

MARSH INSTRUMENT CO. *Sales Affiliate of Jas. P. Marsh Corp.* Dpt. Z, Skokie, Ill.
Marsh Instrument & Valve Co. (Canada) Ltd., 8407 103rd Street, Edmonton, Alberta, Canada

When inquiring check CP 1653 opposite last page

Describes improved photometer for heavy molecules

Besides detailing standard accessories and parts, 22-page catalog includes description of new light scattering photometer. Unit described is complete self-contained instrument for measuring absolute turbidity, dissymmetry, and depolarization of dilute solutions of high molecular weight compounds. Weight-average molecular weights can be determined. Bulletin includes list of references in chronological order on general theory of light scattering.

Bul BP-1000A is issued by Phoenix Precision Instrument Co., Dept. CP, 3803-05 N. Fifth St., Philadelphia 40, Pa. When inquiring specify CP 1654 on handy form opposite last page.

Manual includes case histories on oil seals

Documental case histories are included in 28-page manual on oil seals. Important points are illustrated by close-up photographs and detailed drawings. Descriptions cover latest designs, including molded oil slingers and end face seals.

Bul PK-71A is issued by Johns-Manville, Dept. CP, 22 E. 40th St., New York 16, N. Y. When inquiring specify CP 1655 opposite last page.

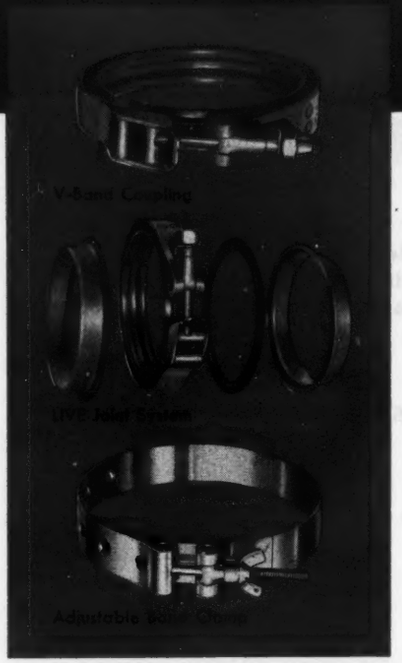
Translates Ziegler process patents for ethylene polymerization

Fourteen patents and patent applications are available as English translations on the Karl Ziegler process for catalytic polymerization of ethylene. Six-page bulletin describes them.

Bul 113 is issued by Research Information Service, Dept. CP, 53 Nassau St., New York 38, N.Y. When inquiring specify CP 1656 on handy form opposite last page.

✦

". . . and then the big guy claimed that entropy changes along the isopleth couldn't be predicted by Nernst's Law . . ."



Marman V-Band Coupling Speeds Filter Change on Processing Equipment

W. M. Sprinkman Corporation of Milwaukee, designers and manufacturers of food processing equipment, recently changed to Marman V-Band Couplings on their entire line of stainless steel fluid filters.

A Sprinkman official reports, "We have found by going to the Marman Couplings that filters are assembled and disassembled much faster. We also find we can hold higher pressures on our filters than was possible using flanges and tie bolts."

If you have a clamping problem on your equipment, let Marman solve it. Write for full information.

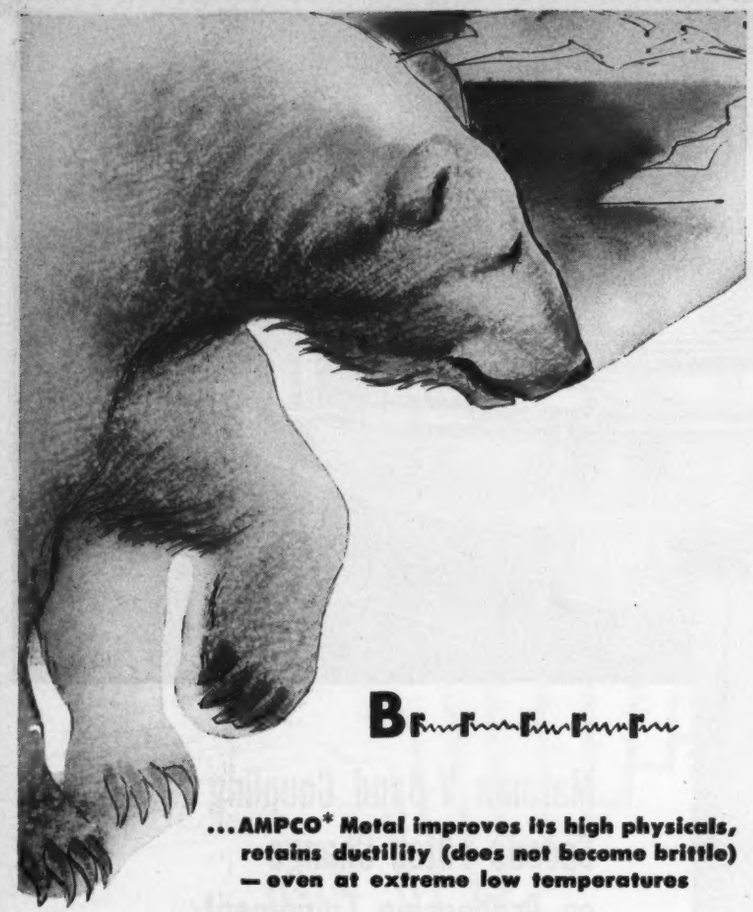
MARMAN PRODUCTS COMPANY, INC.

A SUBSIDIARY OF Aeroquip CORPORATION

11214 EXPOSITION BLVD., LOS ANGELES, CALIFORNIA

MARMAN PRODUCTS ARE MANUFACTURED UNDER VARIOUS U.S. AND FOREIGN PATENTS AND OTHER PATENTS PENDING

When inquiring check CP 1657 opposite last page



...AMPCO* Metal improves its high physicals, retains ductility (does not become brittle) — even at extreme low temperatures

Its ability to perform dependably under conditions of extreme cold without becoming brittle is one of Ampco Metal's more unique properties. And it's one that really pays off for designers of Arctic equipment, gas liquefying machinery, refrigeration equipment, low temperature chemical processing, and similar applications. Tests made with Ampco Metal at temperatures as low as –400° F. show that it remains ductile, retains its high mechanical values, even in this brutal, punishing cold.

But the Ampco story doesn't stop there. This series of remarkable alloys gives you high strength-to-weight ratios — tensiles to 110,000 psi with 10 to 15 percent less weight than ordinary bronzes. It combats corrosion, fatigue, erosion, wear.

All the advantages of one of the world's most versatile metals are yours when you specify Ampco Metal. Get full information from your nearby Ampco field engineer or write us.

AMPCO METAL, INC.
Dept. CP-10
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AMPCO
Sole Producer of Genuine Ampco Metal

*Reg. U. S. Pat. Off.

PR-18

When inquiring check CP 1658 opposite last page

NEW LITERATURE

Explains control of viscosity

Four-page bulletin in two colors explains instrument for continuous indication, recording and control of viscosity under process conditions. Principle of operation is explained. Suggested applications include textiles, paper coatings, pharmaceuticals, resins, adhesives, polymers, paints.

"Viscometran" is issued by Brookfield Engineering Laboratories, Inc., Dept. CP, 240 Cushing St., Stoughton, Mass. When inquiring specify CP 1659 opposite last page.

Issues 112-page volume of tables and data

Paper-bound volume of 112 pages contains selected chemical and physical, engineering, plastics, bacteriological, leather, psychometric and textile tables and charts. Booklet is designed as reference handbook for technicians in these fields and provides standard formulas, charts, definitions in brief and concise form. Publication is free.

"Tables and Data" is available on letterhead request to United States Testing Co., Inc., Dept. CP, 1415 Park Ave., Hoboken, New Jersey.

Verbatim report of 3-day research conference

Proceedings of the Eighth Annual Conference on the Administration of Research have been published in 108-page book. Report covers three-day meeting held at New York University. Included are 24 talks and record of floor discussions that followed talks.

To obtain "Proceedings of the Eighth Annual Conference on the Administration of Research" remit $4.00 direct to New York University Press, Dept. CP, New York, N. Y.

King MANOMETERS

Every Size — for Every Service

U-Type Manometers
- Single Cleanout
- Single Gland-Packed
- Double Cleanout
- Double Gland-Packed
- High Pressure

Low in price, Trouble-free, Easy to install and read

Well-Type Manometers
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Stay clean longer, Easy to service

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FREE LITERATURE gives sizes, construction and prices. Write today! And ask for informative 12-page Manual on Manometers.

KING ENGINEERING PRODUCTS include King-Gages — Manometers — Self-Closing Push Valves — Pressure Transmitters — Sight Feed Bubblers — Overflow Check Valves — Air-flow Snubbers — Sediment Traps — Moisture Indicators

INSTRUMENTS
KING ENGINEERING CORP.
Box 270 • Ann Arbor, Mich.
REPRESENTATIVES IN PRINCIPAL CITIES

When inquiring check CP 1660 opposite last page

BETTER PERFORMANCE
- *Less slippage*
- *Longer life*

Try Darcova Pumcups in your reciprocating pumps and cylinders, and you too will realize what a *big* difference they make.

Because they are "engineered" for their job—in precisely controlled textures, shapes and types—and are noted for outlasting other packings at least 3 to 1! Why not get the advantage of this tremendous saving in maintenance and down-time?

Pumcup designs include the conventional and 45° bevel types in a full range of sizes for all reciprocating pump and cylinder requirements.

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Send today for helpful Bulletin No. 5503.

DARLING VALVE & MANUFACTURING CO.
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DARCOVA
TRADE MARK
PUMCUPS

When inquiring check CP 1661 opposite last page

Gives data on low cost alcohol solvent mix

An alcohol mixture developed as a low cost substitute for n-butyl alcohol is described in four-page data sheet. Uses are given as a component of nitrocellulose lacquers and thinners, SAE moderate duty brake fluids, printing inks, amine resins, and other systems in which butanol is used.

"Solvent 203" is issued by Chemical Div., Celanese Corporation of America, Dept. CP, 180 Madison Ave., New York 16, N. Y. When inquiring specify CP 1662 on handy form opposite last page.

Tells what plastic hose can do in industry

Four-page bulletin tells what hose fabricated from modified polyvinyl alcohol resin can do in chemical processing operations. Hose described is unaffected by all water insoluble liquids. Hose has exceptional resistance to wear and abrasion.

Bul COM-1 is issued by Resistoflex Corp., Dept. CP, Belleville 9, N. J. When inquiring specify CP 1663 on handy form which is located opposite last page.

Describes improved valving of compressors

Improved valving, formerly found only on larger models, is covered in four-page, two-color pamphlet on 20-hp, air-cooled compressor. Also given are details on increased intercooling capacity and compressor specifications.

Form 1540 is issued by Ingersoll-Rand Co., Dept. CP, 11 Broadway, New York 4, N.Y. When inquiring specify CP 1664 on handy form opposite last page.

Describes method to develop hydraulic pressure

Four-page bulletin in two colors describes method of using plant air to develop hydraulic pressures as much as 500 times greater than plant air pressure. Unit described will maintain pressure automatically once desired pressure is reached.

Bulletin 755 is issued by Milton Roy Co., Dept. CP, Station J, 1300 E. Mermaid Lane, Philadelphia 18, Pa. When inquiring specify CP 1665 on handy form opposite last page.

Dracco Multi-Bag Filter installation recovers tons of valuable dusts daily . . . eliminates costly material waste and plant clean-up problems.
Dracco 40-page Bulletin 800 contains complete technical information on "Industrial Dust Control and Recovery" Write for your copy today.
Dracco dust recovery ends waste
To prevent feeding the plant atmosphere and wasting valuable feed additives, International Minerals and Chemical Corporation has installed a Dracco Dust Recovery system at its Bartow (Fla.) plant.
International has found the Dracco system a profitable solution which pays off in dollar savings from valuable dust recovery, plant cleanliness, and better working conditions.
The Dracco system traps all processing dust at its source—at screens, hoppers, elevators, transfer points and bag loaders. This dust is collected in two large Dracco Multi-Bag Filters which operate at 99½%-100% efficiency. All recovered materials are returned to process.
Uncontrolled dust in your plant is an unnecessary expense . . . and may be wasting valuable materials. To convert your dust problem to profits, call in a Dracco engineer today.
DRACCO CORPORATION
4070 East 116th Street • Cleveland 5, Ohio
DRACCO
Performance Proved
Airstream CONVEYORS • DUST CONTROL EQUIPMENT

When inquiring check CP 1666 opposite last page

If you're valving Corrosive Fluids... you need all 3
NO PACKING WORRIES
NON-CONTAMINATING CONSTRUCTION
LEAK TIGHT CLOSURES
Hills-McCanna rubber lined valves in rayon plant service.

get them all in 1.... with Hills-McCanna Diaphragm Valves

Ordinary valve worries of leaking packing, clogged bonnets and corroded working parts are eliminated by the unique design of the Hills-McCanna Saunders Patent diaphragm valve. A tough, resilient diaphragm completely *isolates* the bonnet and its working parts from the valve body. The *cushion* closure is drip tight. Surface irregularities or scale are no cause of leakage because the diaphragm *accommodates* itself to them . . . like a tire to small stones. Packing worries are *easily* forgotten, too—no packing is needed because no fluid can enter the bonnet.

Available with choice of 15 diaphragm materials, body materials of *any* machinable alloy and a choice of linings, Hills-McCanna valves range in sizes from ⅜" through 14". May be used at pressures to 150 psi, temperatures to 350° F. Choice of remote, handwheel or lever operators.

If *you* valve corrosives, write for further information today! HILLS-McCANNA CO., 2370 Nelson St., Chicago 18, Illinois.

HILLS-McCANNA

saunders patent diaphragm valves

Also Manufacturers of
PROPORTIONING PUMPS
FORCE FEED LUBRICATORS • LIGHT ALLOY CASTINGS

When inquiring check CP 1667 opposite last page

NEW LITERATURE

Wall chart on handling caustic soda safely

Wall chart gives 37 specific, successful suggestions based on accumulated plant experience for safely handling solid, liquid, and flake caustic soda.

Chart is 17 x 23", is printed in two colors on coated linen stock tinned on top and bottom with metal eyelets for convenient hanging. It presents safety recommendations covering first aid measures, protective practices and equipment, and dissolving and unloading procedures. Space is also provided for listing telephone numbers for emergency use.

Wall chart is issued by Diamond Alkali Co., Dept. CP, 300 Union Commerce Bldg., Cleveland 14, Ohio. When inquiring specify CP 1668 on handy form opposite last page.

Recording tachometer is described

One-page bulletin describes automatic indicating and recording tachometer. Unit described uses 8-inch chart which can be graduated to record any specific output depending on rate of production or speed.

Indicating and Recording Tachometer is issued by Amthor Testing Instrument Co., Inc., Dept. CP, 45-53 Van Sinderen Ave., Brooklyn 7, N.Y. When inquiring specify CP 1669 on handy form opposite last page.

Covers magnetic brakes and clutches

Eight-page bulletin offers complete clutch and brake selection data and includes specifications of companion line of magnetic brakes. Bul 226-D is issued by Stearns Magnetic Inc., Dept. CP, 612 S. 28th St., Milwaukee, Wis. When inquiring specify CP 1670 on handy form which is opposite last page.

NO MATTER WHAT YOUR LEAKING JOINT PROBLEMS ARE

Leak Lock clings in tough films that stretch rather than break

IT MAY PAY YOU TO TRY LEAK LOCK LIKE OTHER MAINTENANCE MEN HAVE DONE

For 5 years, Leak Lock has been surprising skeptical people who didn't expect to find a "barrier" for an "impossible-to-hold" material. They were surprised at the broad scope of its capabilities.

Leak Lock is being ordered regularly by a well-diversified list of important concerns who regard it as a "find" for special uses.

Send for information and a sample. And here's a tip: Don't depend on a lab. test. Try it on the actual job, and then you will know.

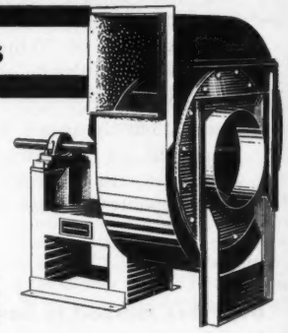
Leak Lock

HIGHSIDE CHEMICALS COMPANY
A UNIT OF STEWART INDUSTRIES INC.
16 COLFAX AVENUE CLIFTON, N. J.

When inquiring check CP 1671 opposite last page

NOW from DRACCO!

performance proved industrial fans



For All Air Handling Jobs
- **General ventilation**
- **Dust collection**
- **Fume and high temperature exhaust work**
- **Conveying refuse, shavings, stringy materials**

Dracco Industrial Fans—"Performance Proved" by 15 years' use with Dracco Dust Control systems—give longer, trouble-free service. Superior construction—welded, vibration-free, all steel elements, no castings to crack, precisely balanced, Rotation and discharge adjustable. Wide range of sizes—inlet diameters 11"-38", pressures to 17" S.P., volumes from 500-46,000 CFM. For better performance, specify Dracco Fans. For details, contact:

Write for 40-page Dracco Fan Bulletin No. 601 containing complete performance data and specifications.

DRACCO CORPORATION
4070 EAST 116th STREET
CLEVELAND 5, OHIO

When inquiring check CP 1672 opposite last page

Primary amyl acetates

An important solvent in coatings and in chemical process industry, primary amyl acetates are covered in four-page data sheet. A mixture of synthetic normal amyl acetate, 2-methyl butyl acetate, and 3-methylbutyl acetate, solvent has a 95% min. ester content, relatively slow evaporation, and is only slightly soluble in water. A number of tables are included.

Bul F-8911 is isued by Carbide and Carbon Chemicals Co., a Div. of Union Carbide and Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. When inquiring check CP 1673 on handy form opposite last page.

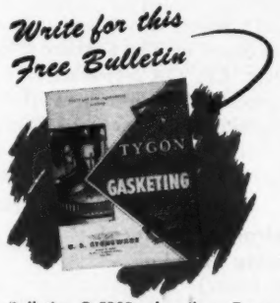
Shows full line of continuous processing equipment

Characteristics, capacities, and applications of manufacturer's complete line of continuous processing equipment are described in 12-page bulletin. Photographs and wash drawings highlight the literature. Unit operations to which equipment is applicable include: agitation, classification, lime slaking, thickening, clarification, filtration, pumping, flocculation, digestion, roasting, calcination, drying, and ion exchange methods of removing salts from solutions.

Bul 7003 is issued by Dorr-Oliver Incorporated, Dept. CP, Barry Place, Stamford, Conn. When inquiring specify CP 1674 on handy form opposite last page.

TYGON GASKETING

Tough • Non-Aging • Chemical-Resistant



Bulletin G-520R describes Tygon Gasketing. It will be mailed promptly on request. Address: Plastics & Synthetics Division, The U. S. Stoneware Co., Akron 9, O.

One sure answer to tough gasketing problems is the versatile corrosion-resistant TYGON family of plastic compounds. For TYGON not only resists acids, alkalies, oils, greases and water — but is strong, resilient, abrasion-resistant and light in weight. TYGON is also impermeable, non-contaminating and non-oxidizing. TYGON can be used for virtually any gasketing job in chemical processing and general industrial equipment — wherever positive, enduring seals or separators are required. For food and beverage uses, special non-toxic compounds are also available.

For service as gasketing, TYGON is made in a number of standard compounds, translucent or glossy black, which offer a range of physical, electrical, and chemical properties for almost any application.

TYGON gaskets can be die-cut from calendered or press-polished sheets (1/64" to 1/2" thick); can be molded in practically any size or shape; or can be extruded as tubing, solid cord, or channel in continuous lengths.

OTHER TYGON PLASTICS: Tygon is likewise made in the form of flexible tubing, hot and cold applied protective coatings, protective sheet linings for acid tanks, and in molded form.

139-E

PLASTICS AND SYNTHETICS DIVISION

U. S. STONEWARE

AKRON 9, OHIO

New York • Chicago • Houston

When inquiring check CP 1675 opposite last page

Are you using wire cloth or wire cloth parts which must be corrosion resistant? Are the service conditions in your plant really tough? If you have a problem selecting the proper anti-corrosive alloy, Newark Wire Cloth may have the answer.

Available in all corrosion resistant metals, Newark Wire Cloth is accurately woven in a wide range of meshes, ranging from very coarse to extremely fine.

If you have a wire cloth problem involving corrosion, please tell us about it . . . we may have the answer.

NEWARK for ACCURACY

A complete line of woven wire cloth and wire cloth parts in all malleable metals.

Send for Catalog E

Newark Wire Cloth COMPANY

351 VERONA AVENUE • NEWARK 4, NEW JERSEY

When inquiring check CP 1676 opposite last page

NEW LITERATURE

Describes dry feeder accurate to ± 1%

Two-color bulletin of three pages describes a belt gravimetric-feeder for continuously feeding dry materials at medium to high rates. Controller maintains accuracies within ±1%. Dimension drawings and photos are included. Unit has a built-in 100 to 1 variable speed transmission, single power source with no auxiliary drive, proportional correction.

Buls 37-M1 and AR-8 are issued by Omega Machine Co., Div. of B-I-F Industries, Inc., Dept. CP, 345 Harris Ave., Providence, R. I. When inquiring specify CP 1677 on handy form opposite last page.

Data sheets describe gas measurement

Two data sheets of two pages each cover instrumentation for gas measurement. One data sheet covers gas flow measurement with a gas-powered integrator. The other sheet covers gas flow measurement with a "start-stop" chart drive. Both data sheets include schematic diagrams of installations.

AED Sheets 131-3 and 131-4 are issued by The Foxboro Co., Dept. CP, 174 Neponset Ave., Foxboro, Mass. Specify CP 1678 opposite last page.

Illustrates structural framing member

Structural framing member which can be used for a variety of items such as racks, palletized loads, and general warehousing construction is described in six-page bulletin. Photographs and column loads are given.

Bul S-2 is issued by Proctor & Schwartz, Inc., Dept. CP, Seventh St. & Tabor Rd., Philadelphia 20, Pa. Specify CP 1679 opposite last page.

OIL HEATING · AT YOUR VELOCITY REQUIREMENTS

TRENT "PACKAGED" CIRCULATION HEATERS

The unique design of TRENT "Packaged" Circulation Heaters *eliminates* return bends in the heating tubes . . . to assure free, uninterrupted flow of liquid through the heater—at the *exact* velocity you require! This means faster, more efficient heating of oil and water for tanks, kettles, fuel oil lines, heat exchangers and all types of process equipment. And because a TRENT "Packaged" Circulation Heater is a complete unit ready for installation you save on initial costs . . . reduce ultimate operating and maintenance costs.

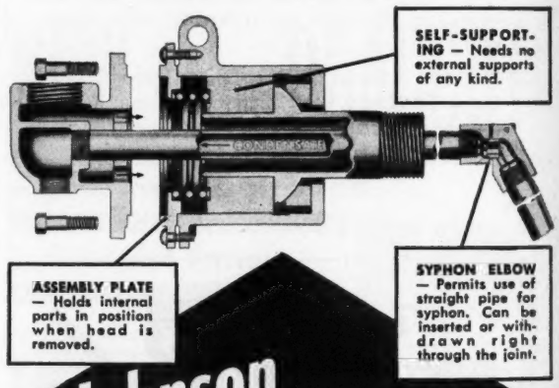
TRENT SOH Oil Circulation Heater
TRENT SWH Water Circulation Heater
furnished fully equipped with

- **All-Welded Companion Pipe Assemblies with Insulation**
- **Indicating or Non-Indicating Thermostats for Temperatures to 550°F.**
- **Rugged Outer Casings with Mounting Tabs**
- **TRENT Multi-Tube Flanged Immersion Heater Unit**
- **Mounted 6" square Terminal Box**

Let a TRENT engineer determine the TRENT "Packaged" Circulation Heater best suited for your operations . . . or custom-engineer one to meet your special wattage and voltage requirements.

TREN INC — Electrically Heated Industrial Equipment — 242 LEVERINGTON AVE., PHILA. 27, PA.

When inquiring check CP 1680 opposite last page


SELF-SUPPORTING — Needs no external supports of any kind.
ASSEMBLY PLATE — Holds internal parts in position when head is removed.
SYPHON ELBOW — Permits use of straight pipe for syphon. Can be inserted or withdrawn right through the joint.

Johnson Rotary Joint with SYPHON ELBOW

Johnson Joints represent the best way industry has yet found to get steam or liquids into rotating rolls and cylinders. They are completely packless, need no lubrication or adjustment. The Type SBP shown gets steam in, condensate out, through the same head. Other types available for through flow service, in sizes to meet all operating needs. *WRITE FOR COMPLETE INFORMATION.*

The Johnson Corporation

826 Wood St., Three Rivers, Mich.

When inquiring check CP 1681 opposite last page

(*Continued from page 7*)

pansion, National has always been careful to choose only products that dovetail with other interests, or else rapidly growing markets where there is plenty of room for a new producer.

The expansion method with the greatest potential for high profits is that based on original research. Profits from a new and unique product are almost always higher than those from established commodities, and new production methods, more economical than the old, are sure profit makers. Then too, patent protection safeguards investments, at least for a few years.

Because National has been in the chemical business for so short a time it has not yet been able to take full advantage of this method of expansion. An extensive research program, with particular emphasis on sodium derivatives and petrochemicals, has been underway, however, since National first started its chemical career. In fact, research programs and expenditures have been larger than normal for the industry because U.S.I.-National hopes and plans to use research-acquired know-how as the basis for most of its future expansion.

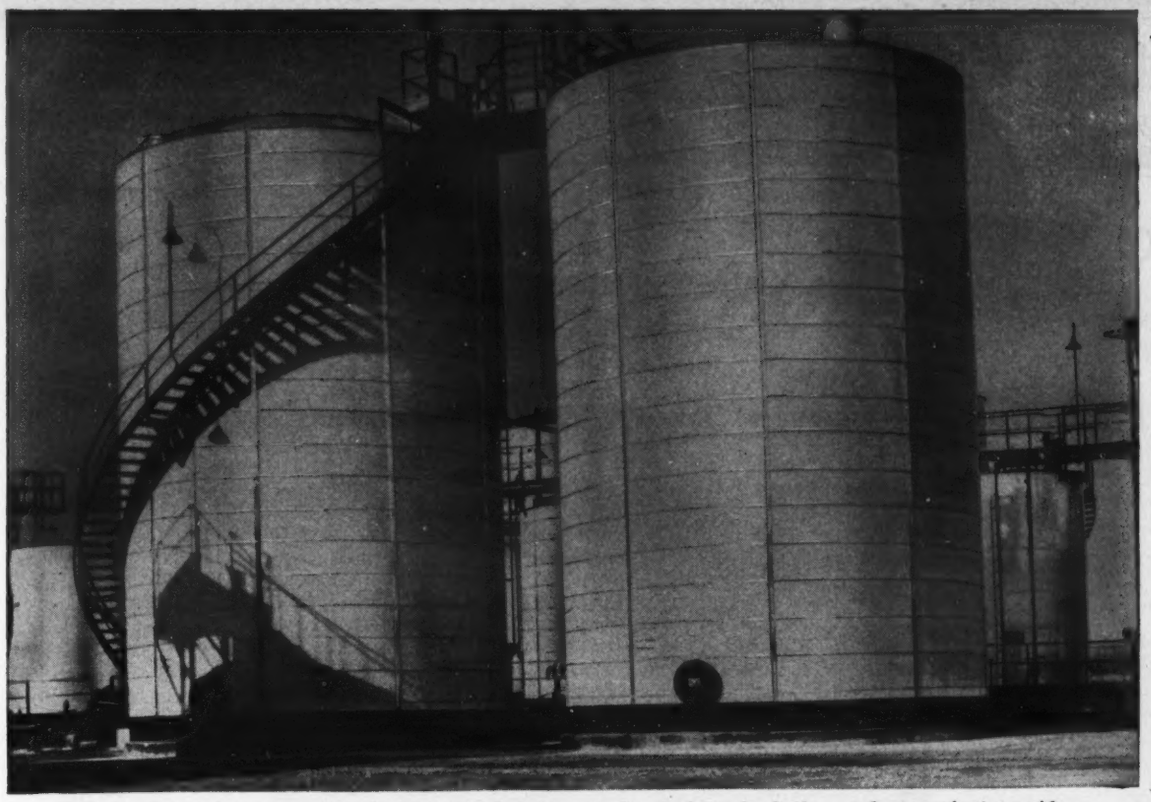
As we trace the history of the chemical industry and the part our company has played in it during the past few years, we see a clear picture of the cyclic nature of chemical industry expansion. Each new stage of growth by one company helps others to grow by making new opportunities, creating new demands, and making available new products for industry and consumer. We have contributed to that growth cycle in the past, just as it has contributed to our development. The chemical industry has justified the faith that led to our initial investment, and in turn we shall continue to make every possible contribution to its growth.

✦ ✦ ✦

Book tells how to get the most from research, engineering

How to get the most from research and engineering is discussed in 59-page booklet. Book is composed of 12 papers presented at the Fall Manufacturing Conference of the AMA. These include reports on organization and administration of research and engineering functions. Section on new product development is also included.

To obtain "Getting the Most From Research and Engineering" remit $1.75 direct to Publication Sales, Dept. P, American Management Association, Dept. CP, 330 W. 42nd Street, New York 36, N. Y. When inquiring specify CP 1682 on handy form opposite last page.



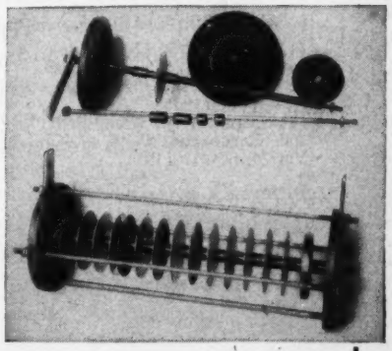
In these nickel-clad tanks, phenol synthesized from cumene is kept pure for long periods. Run-down tanks used to check the product against specifications as it comes off stream are also nickel-clad.

Nickel-cladding guards phenol purity in new synthetic plant

With phenol, metallic pick-up alienates customers.

That's why engineers, in designing one of America's newest synthetic phenol plants for Standard Oil Company of California, made these two big storage tanks . . . and three run-down tanks . . . of nickel-clad steel. The synthetic produced is marketed by Standard's subsidiary, Oronite Chemical Company.

Experience over the years has proved that phenol can be stored in nickel or nickel-clad steel for prolonged periods with negligible metal pick-up. Phenol stays premium-market pure, color excellent . . . a big factor in keeping customers for 35,000,000 pounds of product per year happy.



Good in production, too

In many synthetic plants, nickel and high-nickel alloys, such as Monel®, a nickel-copper alloy, are also used in reactors and other items of production equipment. These alloys possess high resistance to corrosion by acids, caustic soda and many other corrosive chemicals.

Do you have a corrosion or purity problem connected with the manufacture or handling of phenol? Write to Inco's Corrosion Engineering Section. They will be glad to give you the benefit of their experience and research without cost or obligation.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

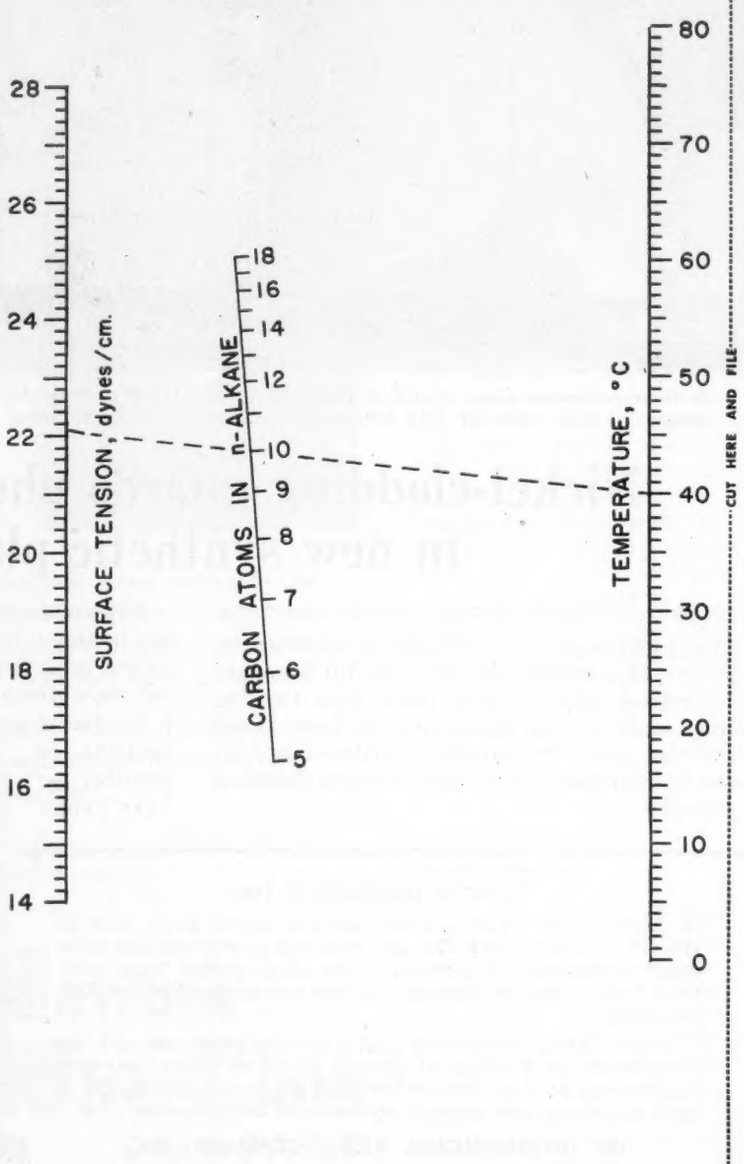
INCO TRADE MARK **Nickel**... for purity

When inquiring check CP 1683 opposite last page

Surface Tension of n-Alkanes

By JOSEPH T. HOGAN,
Professional Engineer, Arabi, Louisiana

Surface tension of hydrocarbons is a fundamental property important in thermodynamic aspects of both theoretical and industrial chemistry. This nomograph, based on recent data[2] and constructed by methods previously described[1] permits rapid, reliable estimates of orthobaric surface tensions of normal alkanes. Its range extends from C_5 to C_{18} and from 0 to 80°C.



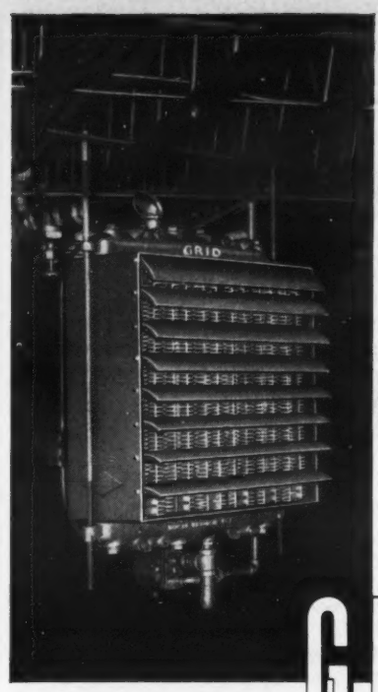
Typical Example

What is the surface tension of n-decane when it is in equilibrium with its vapor at 40°C?

Connect 40 on temperature scale with 10 (for decane) on alkane scale. Straightedge will intersect surface tension scale at 22.1 dynes/cm.

LITERATURE CITED

(1) DAVIS, D. S., "Nomography and Empirical Equations," Chap. X, Reinhold Publishing Corp., New York (1955)
(2) JASPER, J. J., KERR, E. R., and GREGORICH, F. J., *JACS*, Vol 75, p 5252 (1953)



hang 'em ...and forget 'em

GRID
UNIT HEATERS

Trouble-free heating service in the Nation's Major CHEMICAL PLANTS since 1929

...NO Maintenance or Repairs

One of the reasons for this wide acceptance of GRID Unit Heaters is its cast iron construction that stands up well against corrosive fumes of HCl, Cl_2, etc., plus these other outstanding features of construction.

GRID'S All-Cast construction having similar metals in contact with steam prevents electrolytic corrosion. GRID'S ability to withstand steam pressures up to 250# P.S.I.

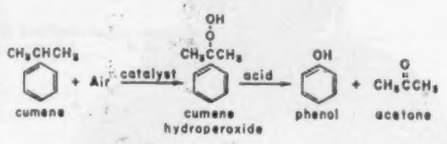
GRID'S low outlet temperatures, proper fan sizes and motor speeds assure delivery of warm comfortable air in ample volume, directly to the spot where it is needed. Maintenance cost conscious management men turn to GRID for relief from the continuous expense of heating failures experienced with ordinary unit heaters. Grid Unit Heaters installed in 1929 are still operating today . . . the only attention needed has been an occasional oiling of the motor. No ordinary unit heater can approach this record.

Write for complete catalog . . . also ask about GRID Blast Coils that are ideal for use throughout many chemical processing industries. (Catalog BC-1049)

D. J. MURRAY MANUFACTURING CO.
Manufacturers Since 1883 • WAUSAU, WISCONSIN
REPRESENTATIVES IN ALL PRINCIPAL CITIES

When inquiring check CP 1684 opposite last page

PHENOLS — BY OXIDATION



(*Continued from page* 11)

the base of their structure to which is attached a branched three-carbon substituent. While cumene and cymene have three sets of double bonds, the pine-derived monocyclic terpenes have but two. But the chemist can add the third by removing two hydrogens. Conversely by adding hydrogen to the monocyclic terpenes, p-menthane is made which has no double bonds. But all three materials can be oxidized to hydroperoxides having important uses.

In oxidizing cumene, for example, cumene hydroperoxide is obtained. Similarly, chemists produce p-cymene hydroperoxide from p-cymene and p-menthane hydroperoxide from p-menthane. Conner and Reese were the men who put Lorand's work on a practical footing so that these materials could be made commercially. At the Brunswick, Georgia laboratory and plant, C. E. Tyler directed the job of making drums of these materials instead of grams.

These hydroperoxides have the necessary attributes to be used as synthetic rubber polymerization catalysts. By 1947, Hercules was supplying cumene hydroperoxide, and later others including p-menthane hydroperoxide for the synthetic rubber production that had established itself during the war. These have become standards for polymerizers. But the chemists are still making new hydroperoxides and peroxides. One of these is DI-CUP (dicumyl peroxide), a product of a continued research program. It, like its older cousins, has moved out of the laboratory to the Brunswick Plant where it is now being semi-commercially made. Though it performs differently than the hydroperoxides, many people interested in hooking smaller molecules together to make big ones are taking a close look at this catalyst.

Most chemists prefer to stay at a respectful distance from peroxidic materials. Hercules, too, approached them with respect . . . but knowing the touchy nature of these compounds, the company has instituted safety precautions that work. Generally speaking, hydroperoxides and peroxides developed are less sensitive than most organic peroxide compounds. Despite the possibility, Hercules has had no serious accidents.

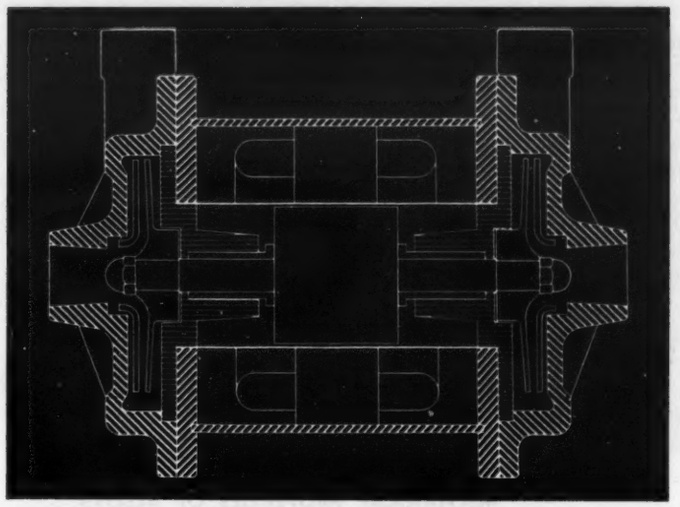
Splitting Reaction Points The Way

Whenever a new man is taken into the lab at Wilmington, he is shown, under controlled conditions, what can happen in the decomposition of peroxides. These new materials, it has been found, go "poof"

(*Continued on page* 251)

New "DOUBLE-ENDED" *Chempump*

for high volume, high head leakproof pumping



TWO PUMPS IN ONE...

Balanced thrust at all deliveries is automatically assured in the new Model DE *Chempump* —first "canned" centrifugal pump for two-stage operation. Essentially two *leakproof* pumps in one, the double-ended *Chempump* is ideal for handling unusually high head or high volume applications, particularly where space is at a premium.

The new "2-in-1" *Chempump* can be manifolded so that the two volutes work in series or parallel. For high volume pumping, parallel manifolding and identical pumping ends are used. Thrust components are equal and opposite on either side and thereby cancel out. When supplied for series operation, automatic thrust balance, despite head differential, is maintained by design differences between the two pumping ends. As with all *Chempumps,* pumped fluid enters the rotor chamber of the Model DE to cool the bearings, rotor, and stator...and to lubricate the bearings. There are no seals, no stuffing boxes. *Chempump can't leak!*

For complete details, write to Chempump Corporation, 1300 East Mermaid Lane, Philadelphia 18, Pa. *Engineering representatives in over 30 principal cities in the United States and Canada.*

Chempump — **first in the field . . . process proved**

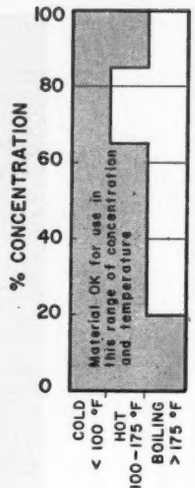
When inquiring check CP 1685 opposite last page

CORROSION KEYS:
Copper Alloys

By ARTHUR I. HEIM,
Research Engineer Copper & Brass Research Association

Keys presented here show performance of several copper alloys with common corrosives. This information is intended to make possible rapid preliminary selection of construction material. It is not intended to show what is best for a given application. Rather, it is designed to separate possibilities from non-possibilities.

Acceptable corrosion rates (areas shown in white) are in the neighborhood of 0.020 inches per year — and in no case do they exceed 0.040. *Cold* refers to temperatures below 100°F, *Hot* to temperatures between 100 and 175°F, and *Boiling* to higher temperatures.



MECHANICAL PROPERTIES OF ALLOYS

Alloy	Tensile psi	Yield point psi	% Elongation in 2"	Rockwell F	Hardness B
Electrolytic tough pitch copper	55,000	50,000	10	94	60
Deoxidized copper	32,000	10,000	45	40	—
Red brass (85% Cu)	70,000	57,000	5	—	77
Phosphor bronze (5% P)	100,000	80,000	4	—	95
Phosphor bronze (8% P)	106,000	80,000	4	—	96
Phosphor bronze (10% P)	83,000	—	32	—	92
Phosphor bronze (1.25% P)	65,000	50,000	8	—	75
High silicon bronze (3% Si)	60,000	25,000	60	85	62
Low silicon bronze (1.5% Si)	70,000	55,000	15	—	80
Aluminum bronze (5% Al)	50-55,000	20-22,000	25-30	—	—
Cupro-nickel (30% Ni)	55,000	20,000	45	—	35
Cupro-nickel (10% Ni)	60,000	57,000	10	100	72

More detailed information about these and other copper alloys is available through the Copper & Brass Research Association, Dept. CP, 420 Lexington Ave., New York 17, N.Y. •

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Simplified Belt Adjustment
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DIV. OF ROBBINS & MYERS, INC., SPRINGFIELD, OHIO

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(*Continued from page* 249)

rather than "bang" . . . the reaction is energetic but not explosive.

While practical uses for hydroperoxides were being established as catalysts, research personnel were trying to see what further could be done to exploit these products. They can be split by acids. Chemists Lorand and L. W. Filar studied this splitting reaction. But this means it was possible to split the p-cymene hydroperoxide molecule into one molecule of p-cresol and one molecule of acetone (monocyclic terpenes produce p-cymene, p-cymene produces p-cresol and acetone . . . p-cresol and acetone from monocycline terpenes — the chemists had achieved their original objective). It could also be used to produce phenol and acetone from cumene hydroperoxide or other phenols depending on the type of hydroperoxide used.

While production of these chemicals on a commercial basis was an obvious possibility, Al Forster and his Development team realized that established competitive processes were so good that yields would have to be high to have a chance of competing. There was reason for optimism. The basic reactions were versatile; air was a cheap and plentiful raw material and thus not subject to periodic shortages that characterized chlorine and sulfuric acid. The problem was to learn how to obtain high yields . . . to develop an inherently lower-cost process.

At this point, Ernest Turk, under the direction of R. W. Ivett, was turned loose with a team of chemists to see what could be done. His group worked on processes for production of both p-cresol and phenol. But because Hercules still had those monocyclic terpenes, the p-cresol venture looked like Hercules' best first bet. This material could be expected to find a use as a dye intermediate, an intermediate for producing antioxidants for gasoline and oil (di-t-butyl-p-cresol) and antihistamines (anisaldehyde). Two years ago, a full scale p-cresol plant was started at Hattiesburg after A. R. Bookout's pilot work at Brunswick, and p-cresol consumption has been climbing as the company's market research group predicted. Para-cresol will be made at Gibbstown, New Jersey — Hercules' Higgins plant — and in a larger plant which will be completed late in 1956.

Plans were going ahead for a phenol plant too. Initial pilot plant work had come off well at Brunswick, though there were some dark moments. The first large quantity of phenol to be prepared, for example, was run off in just about half the expected yield. Discouraging as this appeared, the reasons were found and yields brought up to the expectations of the chemists.

Meanwhile another set of research people was pursuing similar work for Distillers Company, Ltd., of England. To avoid patent and legal tangles, Hercules acquired all U. S. rights to the English work.

(*Continued on page* 253)

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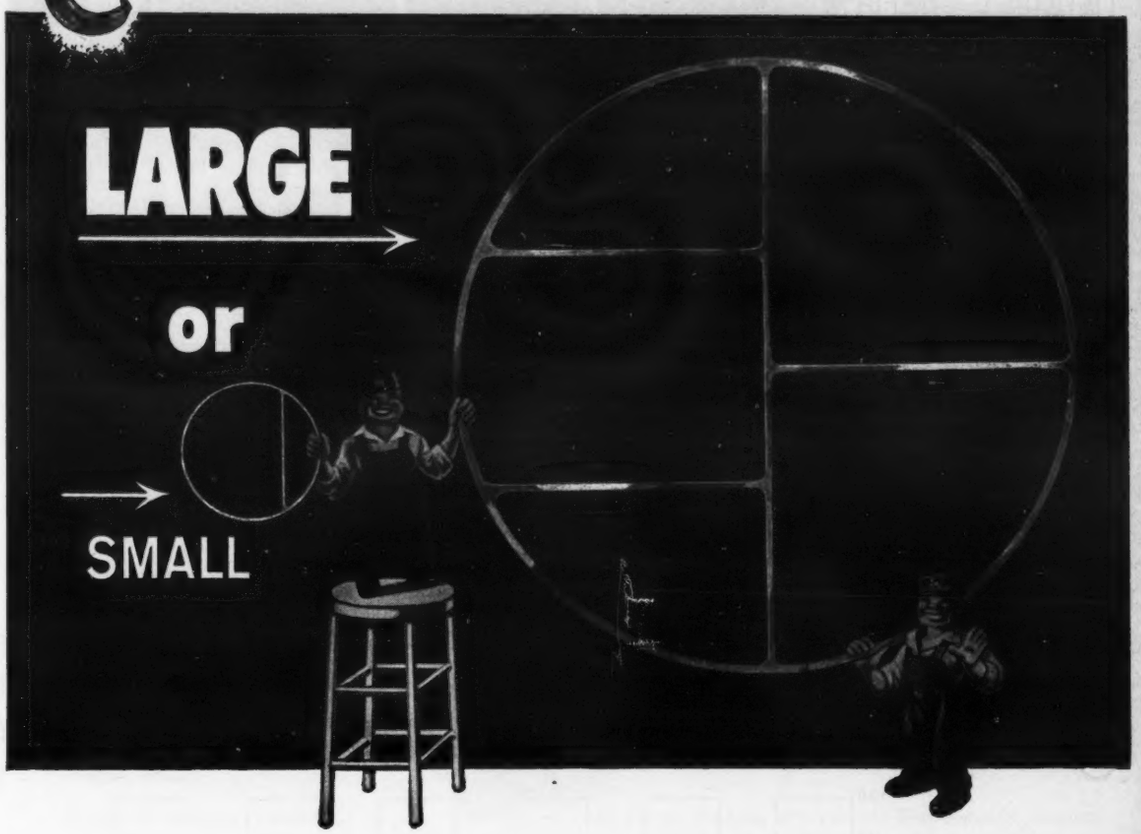

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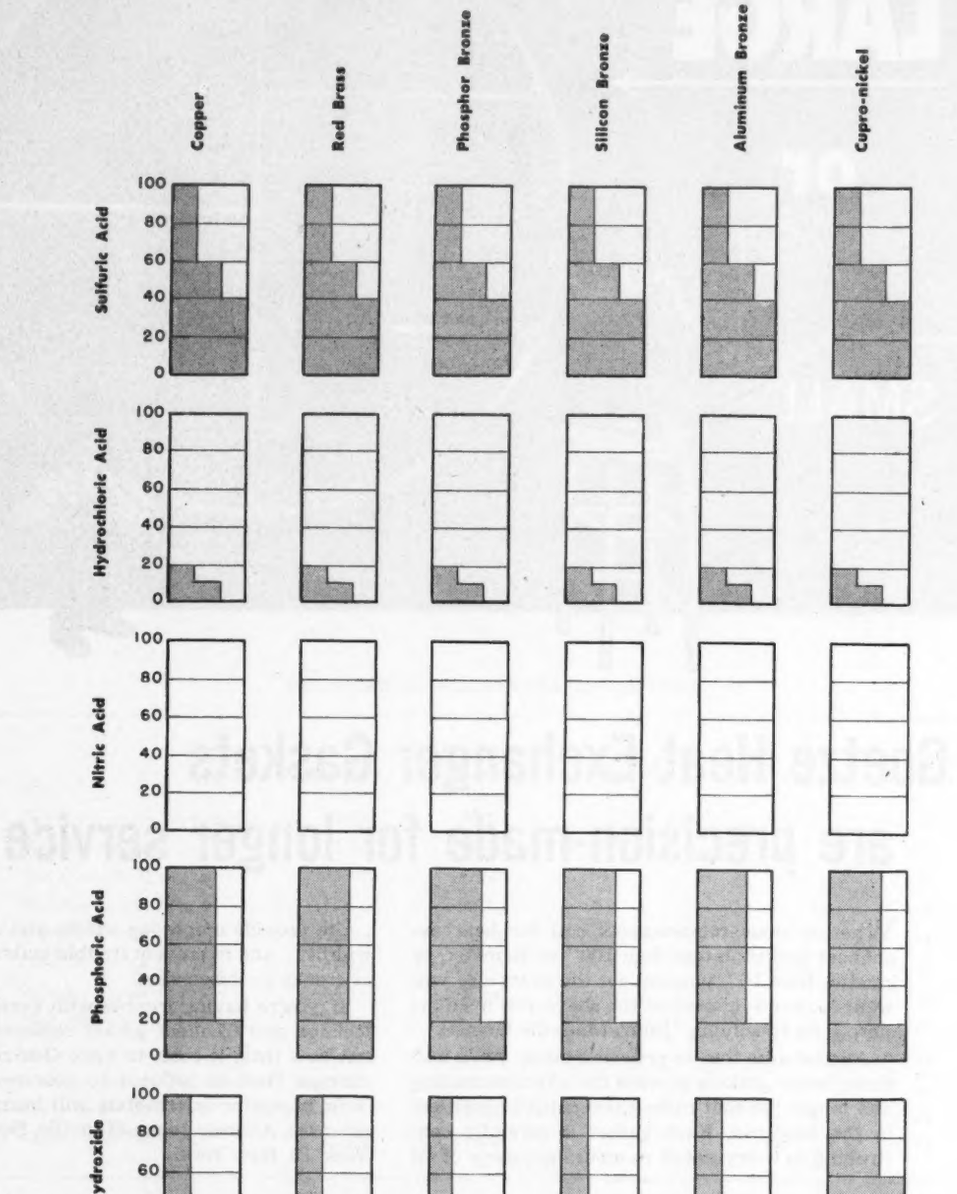
processing and engineering data

134b

Corrosion Keys:



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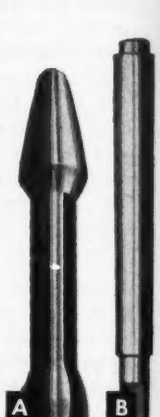

A Tube Pilot guides tubes through baffles and far sheet when retubing.

B Tube Knockout tool for manual or mechanical use.

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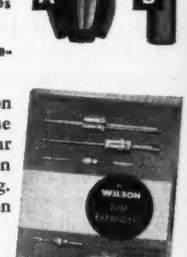

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(*Continued from page* 151)

Along with the phenol process plans came a shock . . . A. L. Larson, Project Engineer, estimated that the plant would cost considerably more than had been expected. After some soul searching, Forster must have mentally gulped as he ordered the project ahead. He had determined to try this new approach against three good competitive processes with a high investment because he was sure it could compete and it would serve as a firm foundation on which to build a new chemical business. This decision led to the building of an $8 million plant at Gibbstown, New Jersey. Designed to produce 26 million pounds of phenol and 16 million pounds of acetone, it can also make α-methylstyrene, acetophenone, hydroperoxides, and high purity p-cresol. Phenol from the Higgins Plant at Gibbstown finds its way into plastics, adhesives, detergents, varnish, agricultural chemicals, and it is also used in refining lube oil. Versatile acetone is used in making rayon, plastics, photographic film, hydraulic brake fluid, cortisone, penicillin, and vitamins A and C.

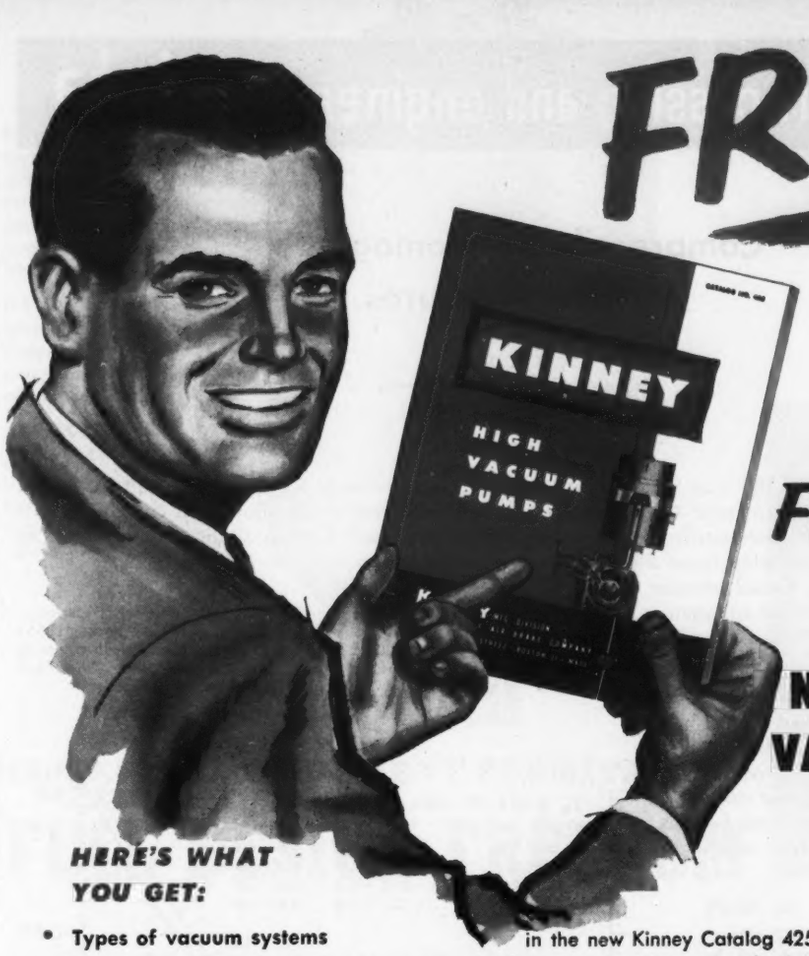
Starting up the new plant was replete with the customary number of engineering "bugs" and oddball experiences. There was, for example, the sickening first performance of the acetone distillation unit at Gibbstown. First few batches distilled failed miserably to meet grade specs set for them . . . a group of glum engineers were diagnosing and verbally redesigning the unit which would have to replace this column. When the operators learned where all the valves were and when to turn them, though, top grade acetone came from the column at *150% of the design figure* — without any engineering changes.

Probably the best remembered fluke connected with startup of the Gibbstown plant was the impromptu shower bath given just about all the workers and watchers as the plant neared completion. To protect against overpressure in the oxidation step, equipment was rigged with rupture discs.

This equipment was hydrostatically tested while engineers and construction gangs were still swarming over much of the plant. The obvious, of course, happened — one of the *upper* rupture discs let go . . . and there must have been thousands of gallons of water poured over plant and people before it was stopped.

With no attempt to underplay what Hercules has already accomplished in concrete results, the importance of what they have done does not lie in the p-cresol, phenol and acetone produced so far. Far more important is the fact that they have opened another avenue for chemical advance . . . and founded another stable source for chemicals so complex that they would have been considered lab curiosities twenty years ago. With materials like dicumyl peroxide already in semi-commercial production, Hercules is looking forward to possibilities of volume production of more complicated materials as uses for them can be developed.

✦ ✦ ✦



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Compressibility Nomograph for Low Pressures

By D. S. DAVIS
Professor of Chemical Engineering
Virginia Polytechnic Institute

The ideal gas law, $pv = nRT$, can be modified by introducing a compressibility factor C, so that the equation $pv = CnRT$ becomes satisfactory for non-ideal gases. This compressibility factor is a function of reduced pressure P_R (actual pressure divided by critical pressure) and reduced temperature T_R (actual absolute temperature divided by absolute critical temperature).

For low values of P_R and T_R, C can be read from a chart similar to that given by Smith[2]. Interpolation on such a chart is inconvenient on two counts: Axes are not closely graduated, and interpolation between reduced temperature curves is difficult.

Nomograph given here has closely graduated axes and is prepared so that compressibility factor can be found readily. Based on linearity of C with P_R, chart was constructed by methods previously described[1].

Two T_R scales are used: straight line for low values of P_R and the curve for higher values.

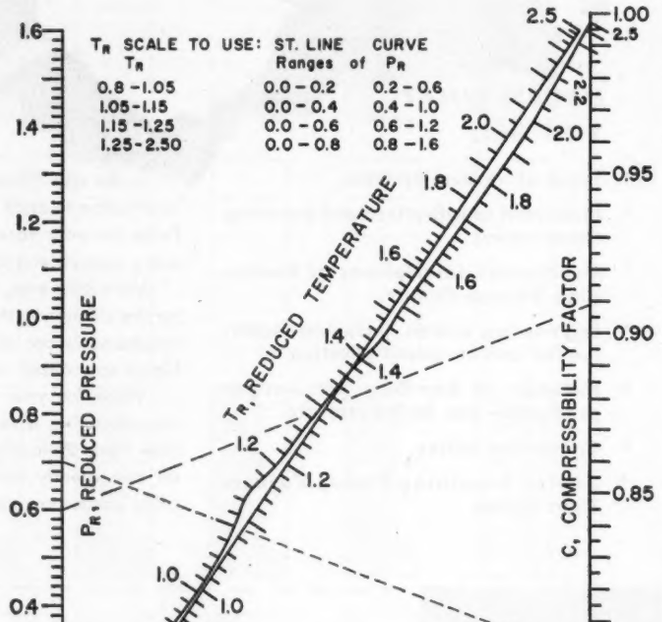
Typical Example

What is the compressibility factor for a non-ideal gas when the reduced pressure is 0.6 and reduced temperature is 1.3?

Refer to bottom line of nomograph's key — since T_R is 1.3, a value between 1.25 and 2.50, and P_R is less than 0.8, T_R scale found on the straight line should be used. Accordingly, connect 0.6 on P_R scale and 1.3 on the straight T_R scale. Note that straight line through these points interescts C scale at 0.909, the desired value of the compressibility factor.

If reduced pressure is 0.7 and reduced temperature 1.1, second line of key shows that curved T_R scale should be used. Compressibility factor would be 0.798 as shown.

LITERATURE CITED
(1) DAVIS, D. S., "Nomography and Emperical Equations," Chap. X, Reinhold Publishing Corp, New York (1955)
(2) SMITH, J. M., "Introduction to Chemical Engineering Thermodynamics," p 69, McGraw-Hill Book Co., New York (1949)


T_R SCALE TO USE: ST. LINE CURVE
T_R Ranges of P_R
0.8 - 1.05 0.0 - 0.2 0.2 - 0.6
1.05 - 1.15 0.0 - 0.4 0.4 - 1.0
1.15 - 1.25 0.0 - 0.6 0.6 - 1.2
1.25 - 2.50 0.0 - 0.8 0.8 - 1.6
P_R, REDUCED PRESSURE
T_R, REDUCED TEMPERATURE
C, COMPRESSIBILITY FACTOR

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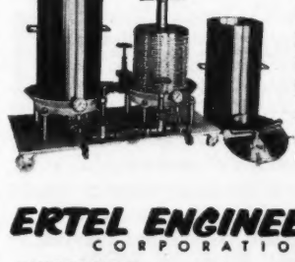

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Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to last page and use the handy "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.

A

Accelerators, Thiazole 239
Acetylenic Compounds 141
Acids 48
Acrolein Derivatives 39
Activated Carbon 52, 59, 228
Additives, Lubricant 56-57
Adipic Acid 238
Adhesive Ingredients 62
Adhesives, Industrial 110
Aerosol Shipping Regulations 148
Agitators 224
Teflon 117
Air Conditioning, Controlled-humidity 234
Alarms, Fire 174
Alcohol Solvents 243
Alloys, Cast Iron 111
Metal 242
Aluminas 59
Aluminum Applications in Industry 156-157
Aluminum Pastes 50
Amines 65
Aminotriazole 49
Ammonia Processes 83
Amyl Acetates, Primary 245
Analysis, Instrumental 140
Analyzers, Gas 98, 180, 185
Infrared 97
Oxygen-combustibles 93
Anhydrides 48
Anti-foam Agents 83
Aptitude Measurement Kits .. 84
Aromatics, Industrial 74
Atomic Energy 236

B

Bag Closing Machines .. 142, 236
Bagging Machines 146
Bags, Multiwall 146
Balances, Constant-weight 178
Bale Breakers 218
Balling Drums for Taconite 157
Bearings, Oilless 258
Bellows, Teflon-lined 166
Benches, Laboratory 182
Benzyl Ethlyene Glycol 46
Benzyl Ethylene Oxide 46
Bins, Concrete Stave 134
Storage 130, 137
Blacks, Channel 61
Furnace 49
Bleaching Processes, Textile 82
Blenders, Dry-batch 189
Blower-exhausters 199
Blowers 192, 263
Stainless Steel 106
Blowing Agents 38
Blue Tetrazolium 57
Bolts 198
Bombs, Vapor-pressure 177
Bonding Material 67
Boron Trifluoride .... 2nd Cover
Boxes, Carboy 132
Corrugated and Fiber 139
Brakes, Magnetic 244
Brinemaking 179, 228
Brushes, Carbon 201
Buckets, Chemical 238
Burners, High-velocity 186
Butyl Carbitol 240

C

Cabinets, Humidity 188
Cable Clamps, Plastic 205
Cage Windings, Motor 225
Calculators 227
Cameras, TV 20-21
Cans 146
Lithographed 145
Safety 175
Caprolactam 51
Carbonate of Potash 49
Career Opportunities 82
Casters 134
Castings, Foundry 120
Castor Oil Derivatives 61
Castor Oils 61
Catalysts ..... 2nd Cover
Caustic Potash 49
Caustic Soda 49, 62
Caustic Soda Handling 244
Cellulose Products 230
Cements, Acid-proof 186
Centrifugals 215
Centrifuges 172
Dehydrating 115
Chelating Agents 40
Chemical Industries Exposition ..... Bet. 66-67
Chemical Raw Materials 44
Chemicals 52
Agricultural 49
High-purity 52
Organic 56
Chlorinators 14
Chlorine, Liquid 49
Chlorophenylpropanol 46
Clamps, Band 241
Pipeline 22
Classifiers, Cyclone 154
Cleaners, Condenser 236
Tube 236, 252
Cleaning Power-house Equipment 24
Cleansers 84

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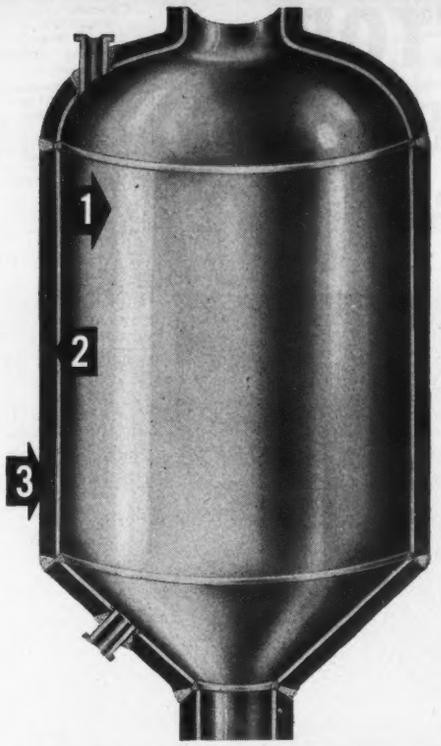

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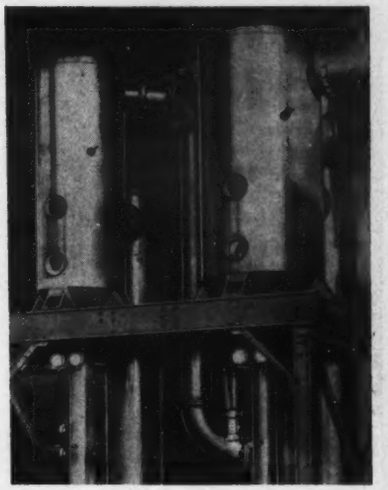

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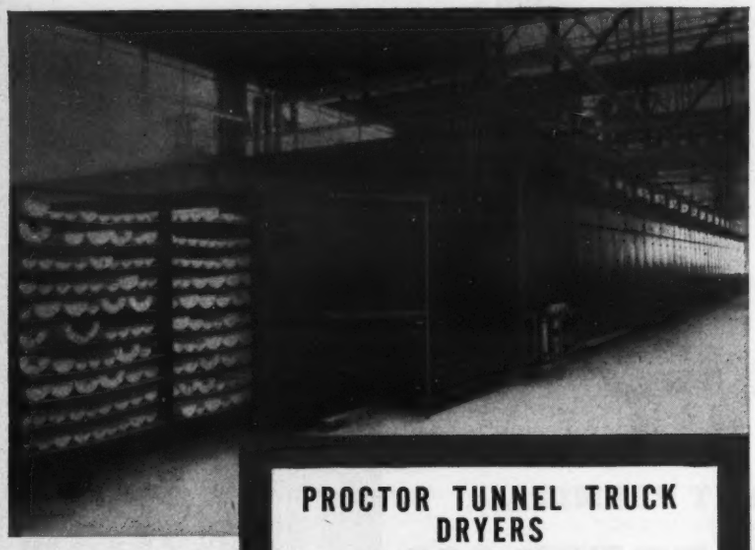

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When inquiring check CP 1692 opposite last page

Closures 142
Protective 234
Cloth, Wire 194, 224, 246
Clothing, Industrial 175
Protective 167
Safety 165, 172
Clutches, Magnetic 244
Coatings 56-57
Aluminum Oxide 120
Corrosion-resistant 107
Epoxy 111
Flame Retardant 171
Neoprene 33
Odorless 112
Primer 112
Protective 20, 46, 113, 116, 118, 149
Zinc 9
Coils, Blast 248
Colloids, Edible 67
Color-difference Meters 196
Columns, Solvent-extraction 132
Combustion Units, Tandem .. 180
Compounds, Acetylenic 141
Compressors 138, 216
Air-cooled 243
Centrifugal 197
Portable Electric Air 222
Condensers 217
Conditioners, Compressed-air 220
Conduits, Flexible 221
Connections, Mounting 99, 100, 101, 102
Contactors, Impulse 103
Containers, Bulk 139
Lined 108
Plastic 112
Porcelain 160
Shipping 25, 130
Strapped 137
Control Boards 126
Control Panels, Boiler 20-21
Controllers, Air-operated 97
Compressed-air 220
Cycle 105
Feed 88, 246
Indicating 166
Industrial 136
Level 89, 167
Liquid-density 154
Liquid-level 94, 99, 100, 101, 102, 136
Motor 91
pH 99
Pressure & Vacuum 180
Proportioning 32-33
Reactor 104
Slurry 95
Temperature 92, 95, 98, 188, 226
Timing 93
Vacuum 105
Valve 94
Viscosity 242
Waste-treatment 91
Conveying Systems, Dry Material 125
Conveyor Belts, Metal 194
Conveyor Dryers 224
Conveyors 131, 132, 236
Oscillating 127
Vibrating 135
Coolers 24, 223
Cooling Towers 209
Copolymers 63
Copper Fabrications 187
Corrosion Data 250-252
Corrugated Board 148
Couplings 241
Hose 217
Pipeline 22
Cranes 130
Bucket 132
Crushers 154
Curing Agents 47
Cutters, Tube 252
Cyclones 151
Liquid 161
Cylinders 150

D

Decals, Heat-resistant 172
Defoamers 74
Dehydrators 115
Demineralizers 156
Water 234
Detergents 84
Dewatering 21
Diatomaceous Materials 70
Dibutyl Fumarate 56, 57
Didecyl Phthalate 50
Diethylene Glycol Monoethyl Ether Acetate 228
Diethylene Glycol Mono Laurate 57
Diethylene Glycol Oleate 235
Dihydropyran 86, 87
Di Iso Decyl Phthalate 47
Dimethyl Itaconate 233
Di-n-butyl Itaconate 233
Dispensers, Label 148
Dispersants, Pigment 58
Dispersers 210
Dispersions, Plastic 111
Displacers 99, 100, 101, 102
Dissolvers 203
Rust 238
Document Holders, Plastic .. 79
Doors, Safety 168
Drain Traps 229
Drains, Electric Power 202
Drives 109
Fluid 27
Drum Dumpers 136
Drum Handling Equipment 134
Drums, Steel 128
Dryers 24, 73, 184, 218, 223, 256
Batch 161
Conical 155
Conveyor 224
Drum 152
Spray 262
Stainless Plastics 161
Drying Equipment 69
Ducts 112
Plastic 72
Duct Systems 178
Dust Collectors 8, 22, 222, 238, 266
Dust Control 243
Dust Samplers 164
Dynamometers 234

E

Electronic Equipment 96
Emulsifiers, Ultrasonic 184
Enamels, Heavy-duty 120
Engineering Standards 87
Engine-Gear Set 229
Ethanolamines 45
Ethylene 12
Ethylenediamine Tetraacetic Acid 40
Ethylene Oxide 5
Ethylene Polymers 64
European Research Service .. 77
Evaporators 16
Exhausters, Rubber-lined 259
Expanders 236
Tube 252
Expansion Joints 227
Extruders, Polyethylene 147

F

Fabrication, Metal 144, 194
Plastic 72, 106
Process Equipment 155
Teflon 110
Tube and Pipe 234
Fabrics, Chemical-resistant .. 169
Fan Engineering 224
Fans 263
Industrial 244, 250
Solid-plastic 115
Ventilating 259
Fasteners, Corrosion-resistant 116
Threaded 198
Fat Refining Agents 53
Fats and Oils 77
Fatty Acids 42, 49, 82
Fatty Alcohols ..... Bet. 30-31
Feeders, Chemical 32, 33, 230
Dry 132
Vibratory 23
Fertilizer Plants 85
Fillers 70
Filling Machines 144
Powder 142
Film, Plastic 147
Filter Aids 174
Filter Cloth 154
Filter Fabrics 162, 185
Filter-leaf Shut-offs 158
Filter Press Closers 146, 163
Filter Presses 210
Filter Sheets, Asbestos 254
Filters 34, 197, 224, 229, 254
Air 90, 235
Continuous String 190
Dust 222

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Horizontal Plate 141
Molecular 179
Pressure 7, 228
Pressure-leaf 214
Firebrick 226
Fire Extinguishers 164, 171, 174
Fire Protection 168
Dry Chemical 173
Fire Protective Devices 175
Fittings, Corrosion-resistant .. 116
Flexible 224
Pipe 122
Plastic-lined 119
PVC 112, 195
Stainless 198, 232, 261
Tube 168, 196
Welding ..... Opp. 18
Flakers 158
Flanges 112
PVC 112
Welding ..... Opp. 18
Flocculating Reagents 40
Floor Patch & Resurfacer 266
Flooring, Industrial 208
Flowmeters, Liquid and Gas 228
Flumes 180
Fluorochemical 45
Fork Truck Attachments 134
Formaldehydes 65
Formulation of Paint and Varnish 141
Fountains, Eye-wash 182
Goggle-wash 182
Furfural 233
Furnaces, Muffle 240

G

Gages, Liquid-level 146
Pressure 216
Tank 90
Tube 236
Vacuum 105
Gaskets, Heat-exchanger 251
Plastic 245
Gearing 235
Gear Units, Mitre 184
Gelometers 187
Generators, Pressure 243
Servomotor-tachometer 226
Steam 213, 218, 220, 233
Glass, Tubular Gage 137
Glass Cylinders 137
Glass Paper 82
Gloves, Industrial 166
Gluconic Acid 66
Gluconic Acid Derivatives .. 66
Glycerine 169
Glycerol Mono Oleate 235
Glycol Ethers 43
Goggles, Safety 170-171
Graders, Mechanical 208
Gradiation Heating 237
Graphite, Impervious 116
Grating, Metal 74, 229
Grinders 189
Grout 234
Gums, Water Soluble 53

H

Hard-facing Alloys 192
Heads, Clad Steel 108
Heat Exchangers 76, 77, 116, 217
Electric 213
Stainless 160
Heat Exchanger Sections, High-pressure 31
Heaters 184
Air 240
Cast 145
Circulation 246
Direct-fired Air 186
Drum 209
Electric 213
Feed Water 20, 21
Unit 248
Heating Equipment 180, 228
Heating Systems 206
Hoists, Monorail 130
Homogenizers 219
Hose, Flexible Metal 227
Metal 240
Plastic 243
Hose Clamps 212
Housing Extensions, Tube 99, 100, 101, 102
Humidity Conditioner 177
Hydraulic Fluids 56, 57
Hydrogen Peroxide 86, 87
Hydroxyadipaldehyde 44

I

Ignition Studies 87
Incinerators 14
Indicators, Explosive Gas 172
pH 240
Temperature 102, 188, 222, 231
Viscosity 189
Industrial Heating 170
Ink Blacks 61
Inorganic Chemicals 230
Insecticides, Pyrethrum 61
Inserts, Titanium 114
Instrument Charts 102
Instrumental Analysis 140
Insulation, Electrical 235
Enamel 223
Glass Block 16
Pipe 195, 198
Spun Mineral Wool 257
Intensifier Units, High-pressure 159
Ion Exchange Process 78
Isophorone 55
Itaconic Acid Esters 233

J

Jar Rolling Machines 216
Joint Compound 244
Joints, Ball 196
Expansion 166
Rotary Pressure 246

K

Kettles 122
Kilns 24

L

Labelers 144
Laboratory Control of Paint and Varnish 141
Laboratory Equipment 3rd Cover
Ladders, Aluminum 130
Laminate Varnishes 53
Latex 3
Leather Treating 60
Liners, Plastic 113
Linings, Corrosion-resistant .. 147
Loaders, Box Car 135
Scoop 135
Lubricants 86, 117
MoS_2 ..... 51, 230
Powdered 203
Lubricators 229
Force Feed 230

M

Magnesites 66
Magnesium Carbonate 66
Magnesium Oxides 66
Magnetic Traps 27
Magnets, Chute 126
Management Information 86, 247
Man-lifts 24
Manometers 180, 242
Mantles, Electric Heating 207
Manufacturing & Maintenance Services 158
Manways 126
Material Handling Equipment 124, 125
Materials, Testing 140
Metal Fabrications 26
Metal Grating 149
Metals, Clad 117
Meters, Air Velocity 210
Color-difference 196
Differential-pressure 90
Flow 100
Liquid 88, 94, 96, 108, 129
Liquid Flow 104
Purge 216
Methanol 37
Methionine ..... Bet. 30-31
Methylene Chloride 86, 87
Methyl Esters 82
Mills 203, 265
Ball and Pebble 216
Compacting 24
Grinding 24

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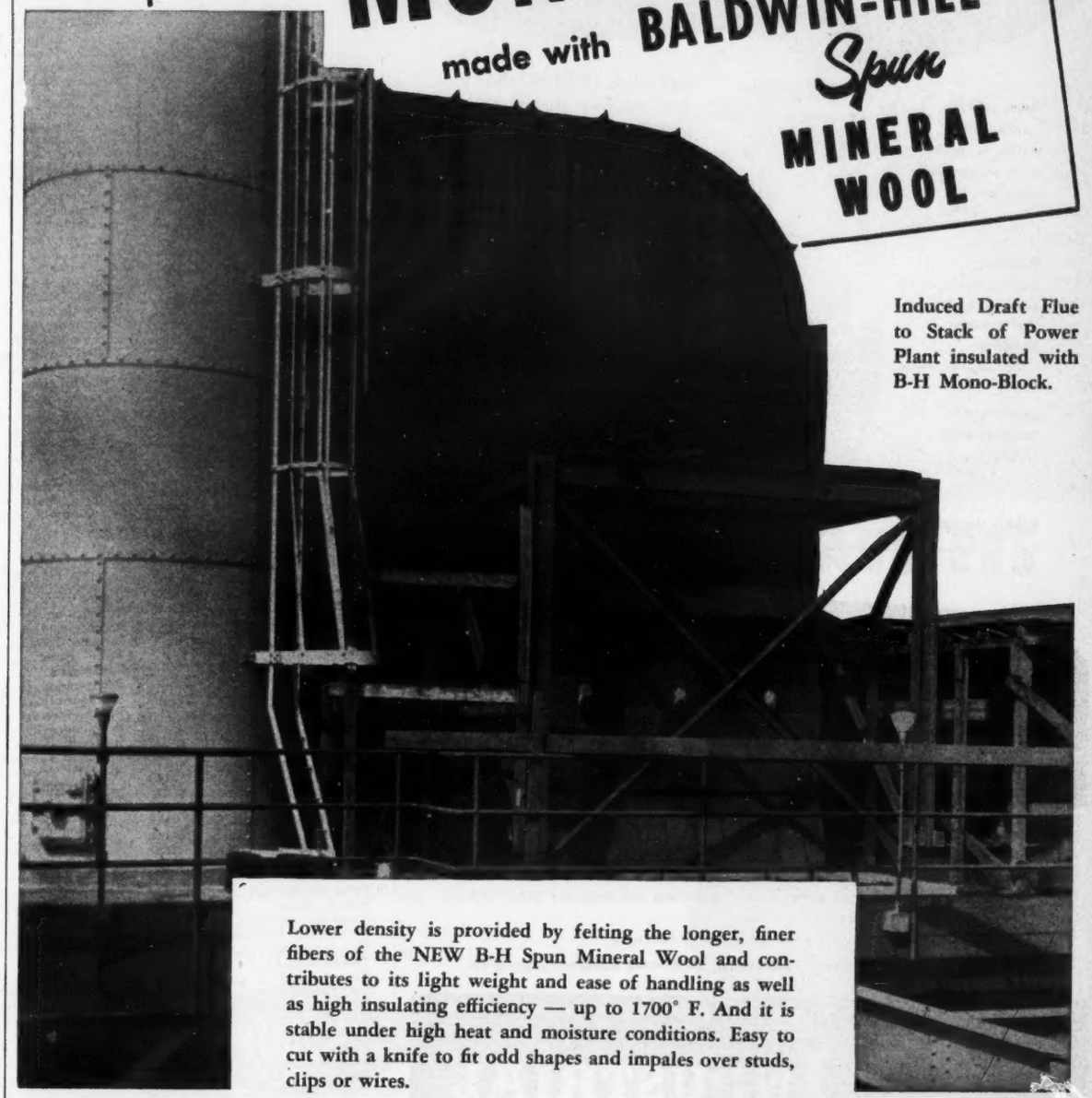

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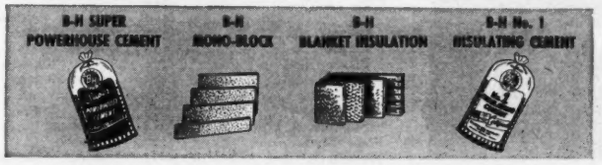

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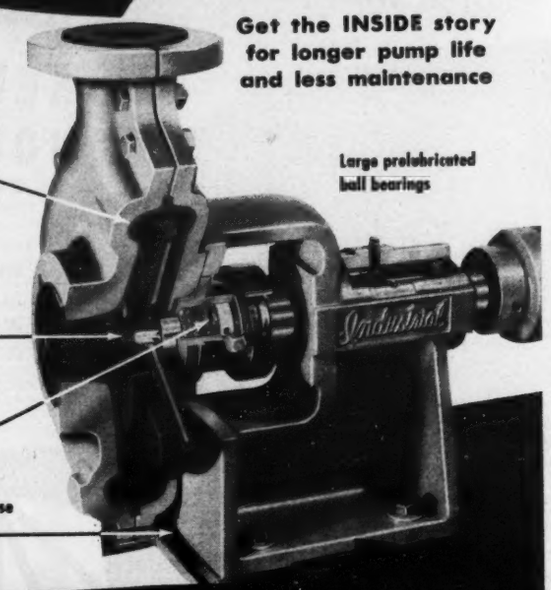
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Impact 163
Jar 216
Paint 26
Ring-roll 189
Roller 24
Swing-sledge 189
Mist Elimination 98
Mixers 18, 158, 210, 233
Laboratory ..... 3rd Cover
Portable ..... 3rd Cover
Side-entering ..... 3rd Cover
Top-entering ..... 3rd Cover
Moisture Testers 96
Molding Compounds, Styrene 54
Monitors, Thermocouple circuit 94
Motor-pumps, Canned 76
Motor Starters 91
Motors 28
Corrosion-proof 123
General-purpose 216
Totally-enclosed 231
Totally-enclosed Fan-cooled 183
Vertical 237
Mountings, Instrument 99, 100, 101, 102

N

Naphthalene, Crude .... 4th Cover
Nickel & Nickel Alloys 247
Nitroparaffins 50
Nomographs, Gas Compressibility 254
Surface Tension 248
Nozzles, Spray 148, 188
Nuts 198
Nylons, Polycapramide 48

O

Odor Control 218
Oils, Industrial 237
Neutral ..... 4th Cover
Plasticizing ..... 4th Cover
Rubber Reclaiming .. 4th Cover
Shingle Stain ..... 4th Cover
Tar Acid ..... 4th Cover
White 43
O-rings, Square 201
Organic Chemicals 45, 230
Organic Solvents 140
Ovens 188, 218
Industrial 160
Laboratory 184

P

Packers, Case 142
Packings, Hydraulic 121
Pump 242
Split-case Metal 232
Teflon 222, 266
Pails, Lined 108
Steel 128
Paints, Alkyd Interior 182
Latex 54, 120, 182
Rubber-base 149
Pallet Rollers 137
Pallets, Plastic 136
Paradichlorobenzene 49
Particle-size Measurement 75
Pelletizing Discs 78
Pentaerythritol 56
Petrochemicals 12
Petrolatums 43
Pharmaceutical Chemicals 45
Phenothiazine ..... 4th Cover
Photometers 241
Pickling 81
Pigmentations in Latex Paints 54
Pigments, Red 66
Pilot Tube 210
Pipe, Corrosion-resistant 114
Dip 109
Glass 118
Plastic 120
Plastic-lined 119
Process 196
Rubber 112
Saran-lined 14
Stainless 140, 234
Plant Maintenance 227
Plasticizers 47, 50, 56-57
Plastics 118
Fluorocarbon 111
Plating 81
Pollution Control, Air 84
Polyacrylates, Modified Ammonium 58
Polyethylene 54, 64, 241
Polyethylene Glycol Monolaurate 229
Polymerizations 241
Polymers, Vinyl 86-87
Polysaccharides, Synthetic 62
Polyvinyl Acetate 63
Porous Mediums 19
Preservatives 40
Presses, Laboratory 188
Vacuum Forming 153
Process Equipment 76-77, 132, 158
Chemical 245
Impervious-graphite 162
Stainless 152-153
Process Equipment Service .. 122
Processing Plants, Mineral .. 152
Propellant Testing 177
Proportioners 92
Propylene Trimer 60
Pulverizers 160, 229
Pumps 163, 232
Acid-handling 213
Centrifugal .. 31, 221, 239, 258
Chemical 108
Controlled-volume 80
Corrosion-resistant 206, 220
Differential-pressure 32-33
Double-ended 249
Heavy-duty 194
High-pressure Reciprocating 196
Industrial 138
Lubrication 222
Micro 183
Micro-bellows 137
Oil-lubricated 85
Piston-diaphragm 23
Positive-displacement 35, 218
Progressing-cavity 260
Proportioning 32-33, 200
Rotary 202, 225, 226
Sanitary 199
Screw 202
Slurry 128, 212
Vacuum 68, 204, 216, 253
Vertical 121
Purchasing Guide 232
Purifiers, Boiler Water 206
Pyrrolidine 86-87

R

Reclamation Systems, Waste 71
Recorders, Gas Flow 246
Recorder-Totalizer 148
Reels, Hose 202
Refractories 123
Refrigeration Units 207
Regulators 229
Relays, Mercury 233
Reodorants 50
Research, Aerosol 144
Research Administration 242
Research Facilities, Atomic Energy 74
Resins ..... 53, 64, 4th Cover
Caoutchouc Hydrocarbon .. 231
Casting 55
Polyethylene ..... Bet. 30-31
PVC 46
Silicone 60
Styrene 41
Vinyl Chloride 44
Water-soluble 63
Respirators 167, 172
Resuscitators, Portable 173
Rings, Welding 211
Roasters 223
Rubber, Chlorinated 20
Rust and Corrosion Prevention 67

S

Sackers, Automatic 134
Safety Glasses 170, 171
Safety Posters 230
Safety Programs 170
Safety Slogans 170
Salt 179
Scales, Bagging 143, 149
Package 144
Truck 132
Screens, Fine Mesh 72
Gyratory 24, 160
Stainless 262
Vibrating 24, 135

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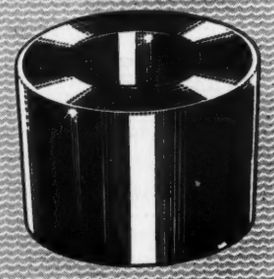

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When inquiring check CP 1695 opposite last page

Wire 224
Scrubbers, Fume 34
Sealers, Case 142
Sealing Compounds, Thread 230
Seals, High-pressure 206
Mechanical ..... 84, 3rd Cover
Oil 241
Teflon 191
Sensing Elements 92
Separators, Air 189
Cyclone 231
Magnetic 136, 208
Specific Gravity 208
Shields, Eye 172
Sifters, Rotary 150
Silica Gels 61
Silicone Gums 66
Silos, Chip 134
Sinks, Silicate Stone 176
Slide Rules 227
Chemical 186
Snubbers 228
Sodium ..... Bet. 30-31, 86, 87
Sodium Nitrite 67
Sodium Silicate 63
Softeners, Cationic 46
Solvent Recovery 52
Solvents ..... 4th Cover
Alcohol 243
Organic 140
Spectrograph 181
Speed Reducers 109, 211
Speed Variators 221
Splitting Machine 198
Spraywelding 192
Sprinklers, Automatic 168
Standpipes 150
Starch Products 53
Statistical Quality Control 80
Steam Generators 208
Steam Traps 178, 182, 203, 227
Thermodynamic 181
Stearic Acids, 12-Hydroxy .. 42
Steel, Clad 255
Nickel-clad 247
Stainless 119, 152, 153
Steel Engineering Data 239
Steel Handbook 194
Stills, Water 103, 234
Strain Gages 138
Strainers 155, 178, 224
Structural Members 246
Studs 198
Succinic Acid 60
Sulfur Dioxide 58
Surface-active Agents .....
..... 42, 53, 78, 79
Low-foam 229
Switches, Control 101
Time 96
Syneresis 21

T

Tables and Data 242
Tachometers, Recording 244
Stationary 237
Tanks, Aluminum 29, 150
Stainless 224
Storage 103
Tank Trailers, Glassed-steel 108
Tape, Polyethylene 29
Terminal Facilities 127
Terminals, Electrical 231
Testers, Line Current 104
Moisture 176
Tetrachloro Phthalic Anhydride 49
Textile Softeners 46
Thermocouple Tables 208
Thermocouples 219
Thermometers, Dial 98
Thiodiglycolic Acid 51
Thixotropic Resins 65
Timers, Electrical 90
Tinplate 211
Titanium ..... Bet. 30-31
Titanium Machining 236
Titanium Sponge 114
Tolylene Diisocyanates 47
Torsion Testing Machine 79
Totalizers, Weight 127
Tower Packings 162
Towers 150
Tractor Shovels 129
Tractors, Towing 129
Transformers 75
Transmitters, Electronic .....
..... 99, 100, 101, 102
Pneumatic 99, 100, 101, 102
Pressure 92
Traps, Magnetic 215
Trichlorethylene 49
Trucks, Cylinder Handling .. 130
Electric Fork 137
Fork 134
Gas Fork 126
Lift 133, 232, 238
Tank 124
Tube, Finned 150
High-temperature 200, 201
Nickel-alloy 120
Plastic 158
PVC 122
Seamless Porous 19
Stainless 31, 140, 234
Turbines, Steam 75

U

Unions, Steel 206
Urea Formaldehyde Concentrate 55
Urethane Foams 52
Utensils, Stainless 236

V

Valves 210
Air Control 223
Air Release 237
Ball 154, 239
Bar-stock 220
Blow-down 178
Butterfly 208
Check 87, 202
Control 214
Corrosion-resistant 225
Diaphragm 30, 244
Drain 138
Foot-operated 213
Forged Steel 235
Gate 35, 36
High-pressure 32, 74
Instrument 97
Line Blind 22
Needle 240
Plastic-lined 119
Plug 25, 193
Porcelain 81
Pressure-regulating 178
Relief 196, 219
Solenoid 169
Stainless 116, 230, 261
Varnishes, Phenolic 53
V-belts 34
High-temperature 212
Vehicles, Paint 42
Ventilation Systems 110
Vents, Tank 203
Vessels, Pressure 76, 77
Vibrators 133
Air and Electric 139
Portable 217
Self-starting 154
Vinyl Resins 57
Vinyls, Foamed 38
Viscometers 86

W

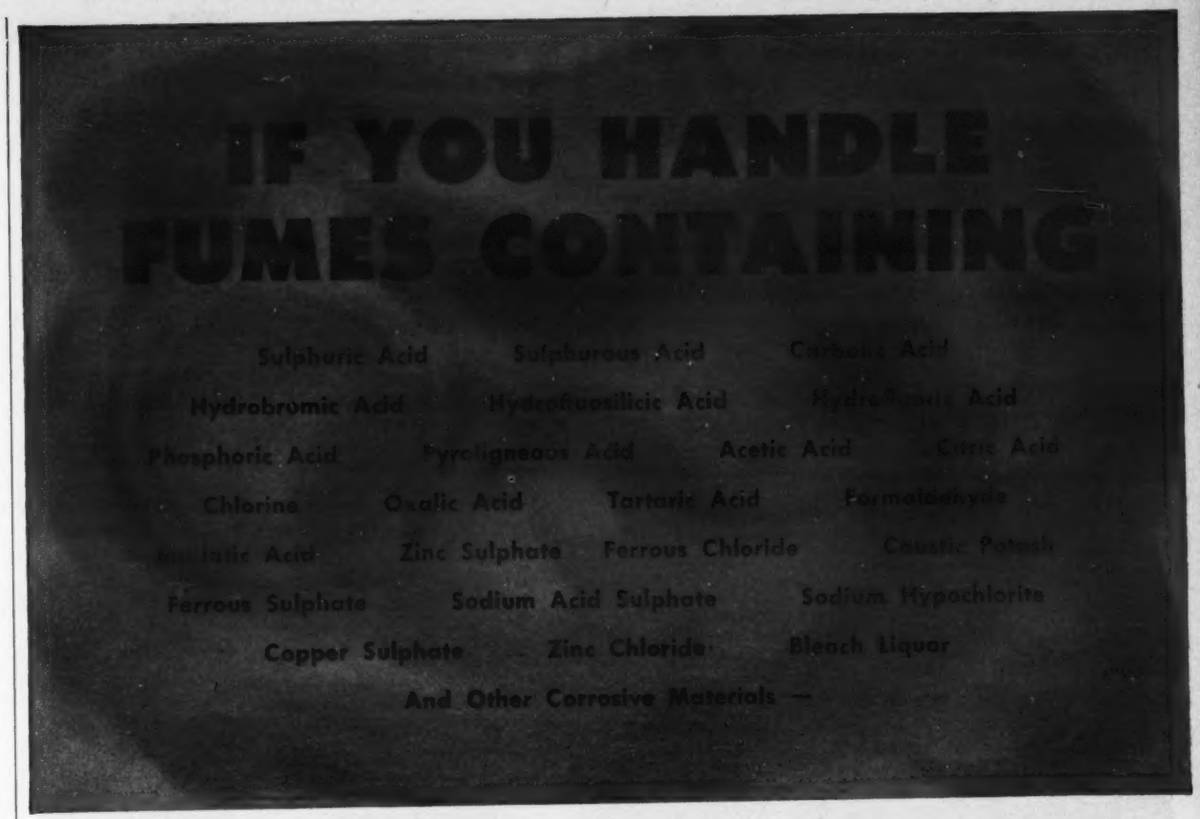
Walls, Retractable 211
Waste Disposal 14
Water Bath, Infrared 182
Water Softeners 159
Water Stills 103
Water Treatment 87, 114, 118
Wattmeters, Graphic 28
Wax Beads 48
Waxes, Casting 59
Microcrystalline 63
Wetting Agents 42
Wheels 134
Wire, Insulated 164
Thermocouple 212
Wire Cloth 239
Wire Rope, Plastic-coated .. 107

X

X-ray, Industrial 232

Z

Ziegler Process 241
Zinc 121



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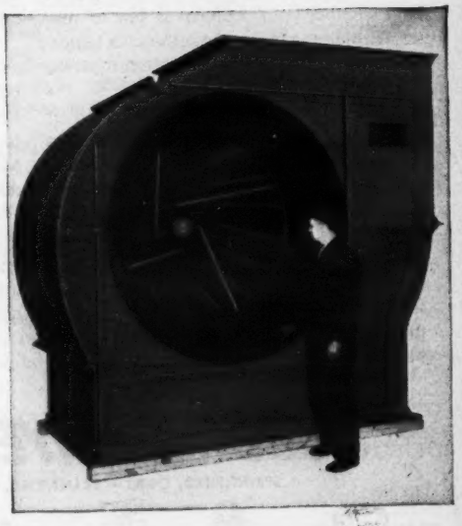

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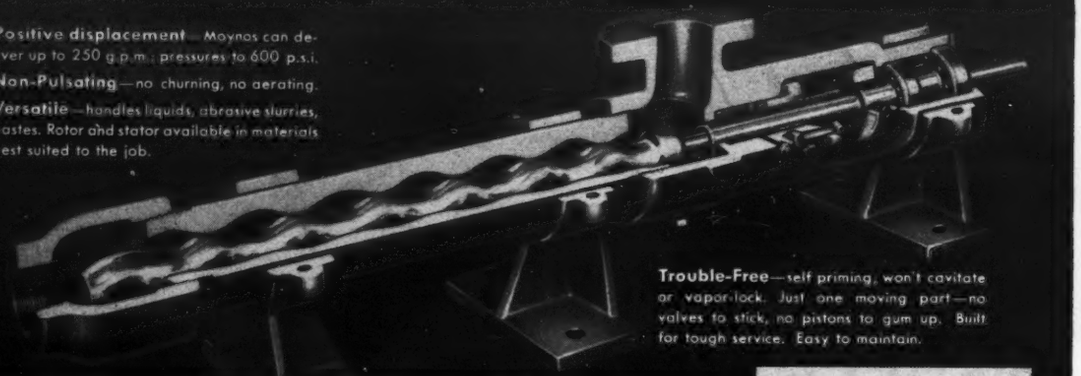

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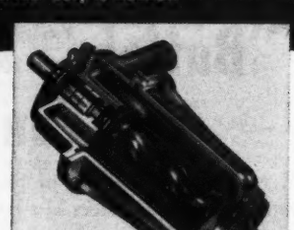

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Advertisers in this issue

A

Abbe Engineering Company .. 216
Agency-Spooner & Kriegel

ACF Industries, Incorporated, Valve Division 25
Agency-Hicks & Greist, Inc.

Aero Research Instrument Company, Inc. 164
Agency-Brandt Advertising Company

Ajax Flexible Coupling Co., Inc. 135
Agency-Horace A. Laney

Alberene Stone Corporation .. 176
Agency-G. M. Basford Company

Alconox, Inc. 84
Agency-Reid, Decker and Stocki, Inc.

Allen-Bradley Co. 91
Agency-The Fensholt Advertising

Allied Radio 96
Agency-George Brodsky

Allis-Chalmers 24, 85, 231
Agency-Compton Advertising, Inc.

Alloy Steel Products Co., Inc 225
Agency-James Thomas Chirurg Company

Alpha Corporation, The 230
Agency-George F. Walsh Advertising

Alpha Plastics Inc. 120
Agency-Felt Advertising, Incorporated

Aluminum Company of America 156, 157
Agency-Ketchum, MacLeod & Grove, Inc.

Aluminum Company of America, Chemicals Division 59
Agency-Ketchum, MacLeod & Grove, Inc.

Aluminum Ladder Co. 130
Agency-Peter Baycura and Associates

Amercoat Corporation, A Subsidiary of American Pipe and Construction Co. 9
Agency-Willard G. Gregory & Company

American Agile Corporation 72
Agency-Herb W. Buerger

American Chain & Cable, R-P&C Valve Division 220
Agency-Reincke, Meyer & Finn, Inc.

American Hard Rubber Company 114
Agency-W. L. Towne Advertising

American Machine & Metals, Inc., Niagara Filters Division 214
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

American Machine & Metals, Inc., Tolhurst Centrifugals Division 215
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

American-Marietta Co., Valdura Paint Division 120, 182
Agency-Turner Advertising

American Optical Company, Safety Products Division 170, 171
Agency-Sutherland-Abbott

American Pulverizer Company 154
Agency-Batz-Hodgson-Neuwoehner Advertising

American Steel & Wire Division, United States Steel Corporation 152, 153
Agency-Batten, Barton, Durstine & Osborn, Incorporated

Ampco Metal, Inc. 242
Agency-Hoffman & York, Inc.

Ansul Chemical Company, Fire Equipment Division .. 173
Agency-Kenyon & Eckhardt Inc.

Ansul Chemical Company, Industrial Chemicals Division 58
Agency-Kenyon & Eckhardt Inc.

Antara Chemicals, A Sales Division of General Aniline & Film Corporation .. 42
Agency-The House of J. Hayden Twiss

Armstrong Machine Works .. 227
Agency-Russell T. Gray, Inc.

Arrow Tools, Incorporated .. 220

Assembly Products, Inc. 166
Agency-George E. Duff Advertising

"Automatic" Sprinkler Corporation 168
Agency-The Robert A. Joyce Company

Avery Adhesive Label Corp. 148
Agency-The Martin R. Klitten Company, Inc.

B

Babcock & Wilcox Company, The, Tubular Products Division 200, 201
Agency-O. S. Tyson and Company, Inc.

Bailey Meter Company 93
Agency-Fuller & Smith & Ross Inc.

Baker & Adamson, General Chemical Division, Allied Chemical & Dye Corporation ..... 2nd Cover
Agency-Atherton & Currier, Inc.

Baker Perkins Inc., Chemical Machinery Division 233
Agency-Price, Tanner & Willox, Inc.

Baker-Raulang Company, The 126, 137
Agency-G. M. Basford Company

Baldwin-Hill Company 257
Agency-Eldridge, Inc.

Barber-Colman Company, Wheelco Instruments Division 92
Agency-Howard H. Monk and Associates

Barnebey-Cheney Company 52
Agency-Byer & Bowman Advertising

Barnstead Still & Sterilizer Co. 234
Agency-Copley Advertising

Bartlett & Snow Co., The C. O. 161
Agency-Henry T. Bourne Advertising

Bauer Bros., Co., The 208
Agency-The Parker Advertising Company

Bayley Blower Company 263
Agency-Barnes Advertising Agency Inc.

Beach-Russ Company 68
Agency-Spooner & Kriegel

Bean Division, John, Food Machinery and Chemical Corporation 196
Agency-Jepson-Murray Advertising

Bemis Bro. Bag Co. 146
Agency-Gardner Advertising Co.

Bennett Industries Incorporated 108
Agency-Schnell & Associates

Binks Manufacturing Co. 188
Agency-Robertson, Buckley & Gotsch, Inc.

Bird Machine Company 7
Agency-Walter B. Snow & Staff, Inc.

Bixby-Zimmer Engineering Co. 262
Agency-Arbingast, Becht and Associates, Inc.

Blaw-Knox Company, Blaw-Knox Equipment Division 238
Agency-Russell T. Gray, Inc.

Bowser, Inc. 96
Agency-Willis S. Martin Company

Bristol Company, The 97
Agency-James Thomas Chirurg Company

Brooks Rotameter Company 216
Agency-Thomas R. Sundheim, Advertising

Brown Fintube Company 31
Agency-Henry T. Bourne Advertising

Buffalo Forge Company 259
Agency-Melvin F. Hall Advertising

Buffalo Meter Co. 94
Agency-Melvin F. Hall Advertising

Buflovak Equipment Division, Blaw-Knox Company 122
Agency-Ketchum, MacLeod & Grove, Inc.

Burgess-Manning Company .. 228
Agency-Merchandising Advertisers, Inc.

B/W Controller Corporation 136
Agency-Rolfe C. Spinning, Incorporated

C

Cambridge Wire Cloth Co., The 194
Agency-Emery Advertising Corporation

Camco Products, Inc. 198
Agency-Vincent Pacelli Advertising

Can Company, R. C. 142
Agency-Batz-Hodgson-Neuwoehner Advertising

Carbide and Carbon Chemicals Company, A Division of Union Carbide and Carbon Corporation 39
Agency-J. M. Mathes, Inc.

Carbide and Carbon Chemicals Company, A Division of Union Carbide and Carbon Corporation, Textile Fibers Department 175
Agency-Anderson & Cairns, Inc.

Carborundum Co., The, Refractories Division 123
Agency-G. M. Basford Company

Carpenter Steel Company, The, Alloy Tube Division 234
Agency-Beaumont, Heller & Sperling, Inc.

Carrier Conveyor Corporation 131
Agency-Doe-Anderson Advertising

Carver Inc., Fred S. 188
Agency-J. C. Bull Incorporated

Catawissa Valve and Fittings Company 206
Agency-Charles E. Williams Advertising

Celanese Corporation of America, Chemical Division 65
Agency-Ellington & Company Inc.

Celluplastic Corporation 112
Agency-Heffernan & McMahon Inc.

Chemical & Power Products, Inc. 110
Agency-Spooner & Kriegel

Chemical Industries Exposition ..... Opp. 66
Agency-O. S. Tyson and Company, Inc.

Chempump Corporation 249
Agency-The Aitkin-Kynett Co.

Chicago Bridge & Iron Company 29
Agency-Russell T. Gray, Inc.

Chicago Eye Shield Company 172
Agency-Reincke, Meyer & Finn, Inc.

Cleveland Vibrator Company, The 139
Agency-Wellman, Buschman & Hines

Cleveland Wire Cloth & Mfg. Co., The 224
Agency-Interstate Advertising Company

Cole Manufacturing Co., R. D. 150
Agency-Barton E. Wyatt & Company

Colton Company, Arthur, Div. Snyder Tool & Engineering Company 224
Agency-Clark & Bobertz, Inc.

Columbia-Geneva Steel Division, United States Steel Corporation 152, 153
Agency-Batten, Barton, Durstine & Osborn, Incorporated

Combustion Engineering, Inc., Raymond Division 265
Agency-Wamsley and Heer, Inc.

Commercial Solvents Corp., Industrial Chemicals Dept. 50
Agency-Fuller & Smith & Ross, Inc.

Condenser Service & Engineering Co., Inc. 158
Agency-Joseph S. Vogel & Co.

Continental Can Company 145
Agency-Batten, Barton, Durstine & Osborn, Incorporated

Cooper Alloy Corporation 261
Agency-Mahool Advertising Inc.

Corning Glass Works 118
Agency-Charles L. Rumrill & Co., Inc.

Crane Co. 235
Agency-The Buchen Company

Crane Packing Co. 191
Agency-Symonds, MacKenzie & Company, Inc.

Crawford Fitting Co. 168
Agency-The W. N. Gates Company

Crown Gear, A Division of Harrington & Richardson, Inc. 184
Agency-Cooney & Connor

D

Damascus Tube Company 140
Agency-Meek and Thomas, Inc.

Darling Valve & Manufacturing Co. 242
Agency-The Griswold-Eshleman Co.

Darnell Corporation, Ltd. 134
Agency-Rhea Advertising

Davison Chemical Company, Division of W. R. Grace & Co. 61
Agency-St. Georges & Keyes, Inc.

Day Company, The 222
Agency-Scrymiger & Osterholt

Decker Aviation Corporation 90
Agency-The Harry P. Bridge Company

De Laval Steam Turbine Company 239
Agency-Michel-Cather, Inc.

Denver Equipment Co. 71
Agency-Galen E. Broyles Co., Inc.

Despatch Oven Company 160
Agency-Foulke Agency, Inc.

Dicalite Divlsion, Great Lakes Carbon Corporation 70
Agency-Darwin H. Clark Co.

Dore' Co., John L. 166
Agency-Ullrich and Brown

Dorr-Oliver, Incorporated 212, 213
Agency-Sutherland-Abbott

Dow Chemical Company, The 41, 119
Agency-MacManus, John & Adams, Inc.

Dow Corning Corporation .. 74
Agency-Wagnitz Advertising, Inc.

Dracco Corporation 243, 244
Agency-The Jayme Organization, Inc.

Ducon Company, The 238
Agency-C. M. Johnson & Associates, Inc.

Du Pont de Nemours & Co., (Inc.), E. I., ... 86, 87
Agency-Batten, Barton, Durstine & Osborn, Incorporated

Du Pont de Nemours & Co., (Inc.), E. I., Polychemicals Dept. 37
Agency-Batten, Barton, Durstine & Osborn, Incorporated

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1 2

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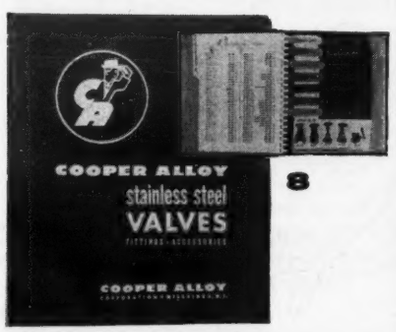

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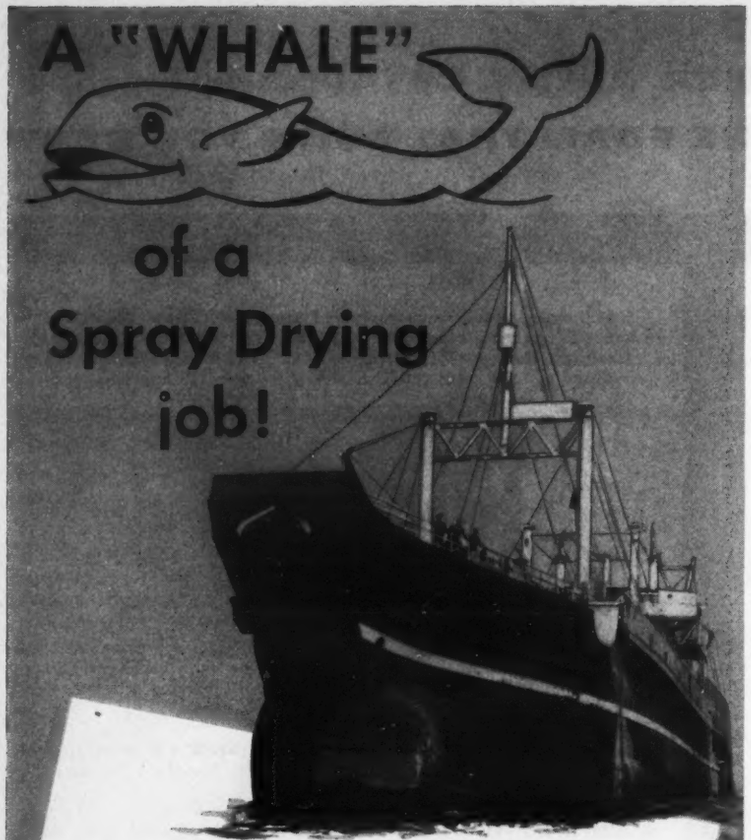

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When inquiring check CP 1699 opposite last page

Dust Suppression & Engineering Co. 266
Dwyer Mfg. Co., F. W. 216
Agency-Symonds, MacKenzie & Company

E

Eastman Chemical Products, Inc., Subsidiary of Eastman Kodak Company 48
Agency-Kenyon & Eckhardt Inc.
Eco Engineering Company 206
Agency-Raf Advertising Incorporated
Eimco Corporation, The 197
Agency-Matsie Company
El Dorado Oil Works 82
Agency-Sidney Garfield & Associates
Electric Auto-Lite Company, The, Instrument & Gauge Division 222
Agency-J. C. Ball Inc.
Elliott Company, Lagonda Division 236
Agency-Peterson & Kempner, Inc.
Ertel Engineering Corporation 254
Agency-W. N. Hudson, Advertising
Euclid Crane & Hoist Co., The 130
Agency-T. H. Ball and Son
Exact Weight Scale Company, The 144
Agency-Byer & Bowman Advertising

F

Falk Corporation, The 109
Agency-Reincke, Meyer & Finn
Felt Products Mfg. Co. 230
Agency-Van Auken, Ragland & Stevens
Fenwall Incorporated 188
Agency-James Thomas Chirurg Company
Ficklen III, Joseph B. 164
Fielden Instrument Division, Robertshaw-Fulton Controls Company 89
Agency-Arndt, Preston, Chapin, Lamp & Keen, Inc.
Filtration Engineers, Inc. 190
Agency-W. L. Towne Advertising
Finch Paint & Chemical Co., Division of Desmond Brothers Paint Company .. 118
Agency-"Ad" Larson, Advertising
Firestone Plastics Company, Chemical Sales Division 46
Agency-Grey Advertising Agency, Inc.
Fischbein Co., Dave 142
Agency-Fischbein Advertising
Fiske Brothers Refining Co., Lubriplate Division 86
Agency-E. M. Freystadt Associates, Inc.
Flexrock Company 266
Agency-Walter S. Chittick Company
Flexrock Company, Mechanical Packing Division 266
Agency-Walter S. Chittick Company
Flintkote Company, The, Industrial Products Division 110
Agency-Marschalk and Pratt, Division of McCann-Erickson, Inc.
Frantz Co., Inc., S. G. 136
Agency-Eldridge, Inc.
Fritzsche Brothers, Inc. 218
Fuller Company, General American Transportation Corporation Subsidiary 125
Agency-O. S. Tyson and Company, Inc.

G

Gardner Laboratory, Inc. 196
Garlock Packing Company, The 232
Agency-Hutchins Advertising Company, Inc.
Gates Rubber Co., The 34
Agency-Harold Walter Clark, Inc.
Gaylord Container Corporation 139
Agency-Oakleigh R. French & Associates
General American Transportation Corporation, Louisville Drying Machinery Unit 73
Agency-Weiss & Geller, Inc.
General American Transportation Corporation, Turbo Mixer Division 18
Agency-Weiss & Geller, Inc.
General Electric Company, Silicone Products Department 83
Agency-Benton & Bowles, Inc.
General Magnesite & Magnesia Company 66
Agency-Kammann-Mahan, Inc.
General Precision Equipment Corporation 20, 21
Agency-Geer, DuBois & Company, Inc.
Gifford-Wood Co. 136
Agency-O. S. Tyson and Company, Inc.
Glas-Col Apparatus Company, Inc. 207
Agency-The Fensholt Advertising
Globe Company, The, Grip-Strut Division 149
Agency-Ross Llewellyn Inc.
Glycerine Producers' Association 169
Agency-G. M. Basford Company
Glyco Products Co., Inc. 40
Agency-G. M. Basford Company
Goodall Rubber Company 112
Agency-George C. Taylor
Goodrich Chemical Company, B. F. 64
Agency-The Griswold-Eshleman Co.
Goodyear, Chemical Division 3
Agency-Kudner Agency, Inc.
Gordon Co., Claud S. 212
Agency-Merrill, McEnroe & Associates, Inc.
Goslin-Birmingham Manufacturing Co., Inc. 158
Agency-J. Howard Allison & Company
Graphic Systems 126
Agency-Diener & Dorskind Incorporated
Graphite Metallizing Corporation 258
Agency-The Kotula Company
Greiner Co., The Emil 180
Agency-Fairfax, Inc.
Grinnell Company, Inc. 30
Agency-Horton-Noyes Company
Gump Co., B. F. 150
Agency-Merrill, McEnroe & Associates, Inc.
Gustin-Bacon Manufacturing Co. 195
Agency-Valentine-Radford

H

Hamer Valves, Inc. 22
Agency-The McCarty Company
Hammond Iron Works 26
Agency-Sam J. Gallay Advertising
Hardinge Company, Incorporated 184
Agency-Adams Associates, Inc.
Hassall, Inc., John 116
Agency-Sanger-Funnell, Incorporated
Hastings Instrument Company, Inc., Hico Instrument Division 105

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When inquiring check CP 1700 opposite last page

Haws Drinking Faucet Co. 182
Agency-Pacific Advertising Staff

Heat-Timer Corporation, Recorder Division 148
Agency-Page, Noel, Brown, Inc.

Heyl & Patterson Inc. 151
Agency-Dan A. Sullivan

Highside Chemicals Company 244
Agency-Gallard Advertising Agency, Inc.

Hills-McCanna Co. 244
Agency-Russell T. Gray, Inc.

Hooker Electrochemical Company 62
Agency-Charles L. Rumrill & Co., Inc.

Hough Co., The Frank G., Subsidiary International Harvester Company 129
Agency-Ervin R. Abramson

I

Illinois Testing Laboratories, Inc. 210
Agency-The Buchen Company

Industrial Division of Colonial Plastics Mfg. Co., Subsidiary of the Van Dorn Iron Works Co. 106
Agency-The Bayless-Kerr Company

Industrial Filter & Pump Mfg. Co 258
Agency-Hollander & Weghorn

Industrial Gloves Company .. 165
Agency-Kirkgasser-Drew

Ingersoll-Rand, Cameron Pump Division 108
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

Insul-Mastic Corporation of America 107
Agency-Dan A. Sullivan

International Nickel Company, Inc., The 116
Agency-Marschalk and Pratt, Division of McCann-Erickson, Inc.

International Salt Company, Inc., Industrial Division .. 179
Agency-Scheideler, Beck & Werner, Inc.

J

Jabsco Pump Company 138
Agency-The Martin R. Klitten Company, Inc.

Jaeger Machine Company, The 135
Agency-Maurice Mullay, Inc.

Jamesbury Corp. 154
Agency-Heath Advertising

James-Pond-Clark 196
Agency-Orin E. Weir Publicity Assoc.

Jefferson Chemical Company, Inc. 5
Agency-Hazard Advertising Company

Jenkins Bros. 193
Agency-Horton-Noyes Company

Johns-Manville 174, 251
Agency-J. Walter Thompson Company

Johnson Corporation, The .. 246
Agency-Kreicker & Meloan, Inc.

K

Kalamazoo Tank and Silo Company, Industrial Storage Bin Div. 130
Agency-Paxon Advertising, Inc.

Kano Labs 238
Agency-Bachrodt, Newell, O'Kane and Gano

Kellogg Company, The M. W., Chemical Manufacturing Division 111
Agency-Ellington & Company, Inc.

Kewanee-Ross Corporation, Division of American Radiator & Standard Sanitary Corporation 217
Agency-Harold Warner Company

King Engineering Corp. 242
Agency-Carl Connable Advertising

Kinney Mfg. Division, The New York Air Brake Company 253
Agency-Hammond-Goff Co.

Klemp Metal Grating 74
Agency-Elliot, Jaynes & Baruch

Knight, Maurice A. 186
Agency-Brown Advertising Agency

Koppers Company, Inc., Tar Products Division 149
Agency-Batten, Barton, Durstine & Osborn, Incorporated

Koven & Bro., Inc., L. O. .. 155
Agency-Lucerna Company Inc.

Kurztown Foundry & Machine Corp. 120
Agency-Ritter Lieberman, Incorporated

L

LaBour Company, Inc., The 221
Agency-Grimm & Craigle

Lancaster Chemical Corp. 210
Agency-Sherman Lawrence

Lapp Insulator Co., Inc., Process Equipment Division 23, 81
Agency-Ed Wolff & Associates

Lenape Hydraulic Pressing & Forging Co. 126
Agency-Renner Advertisers

Link-Belt Company 127, 223
Agency-Klau-Van Pietersom-Dunlap, Inc.

Liquidometer Corp., The 146
Agency-Lucerna Company Inc.

Littleford Bros., Inc. 144
Agency-Perry-Brown Inc.

Los Alamos Scientific Laboratory of the University of California 82
Agency-Ward Hicks Advertising

Louisville Drying Machinery Unit, General American Transportation Corporation 73
Agency-Weiss and Geller, Inc.

Lubriplate Division, Fiske Brothers Refining Co. 86
Agency-E. M. Freystadt Associates, Inc.

Lukens Steel Company 255
Agency-Fuller & Smith & Ross Inc.

M

Manning, Maxwell & Moore, Inc. 36
Agency-Fuller & Smith & Ross Inc.

Manton-Gaulin Mfg. Co., Inc. 219
Agency-Sutherland-Abbott

Manzel, Division of Houdaille-Hershey Corp. .. 230
Agency-Baldwin, Bowers & Strachan Inc.

Marman Products Company, Inc., A Subsidiary of Aeroquip Corporation 241
Agency-The Fred M. Randall Company

Marsh Instrument Co., Sales Affiliate of Jas. P. Marsh Corp. 240
Agency-Kreicker & Meloan, Inc.

Martin Engineering Company 154
Agency-Kenneth B. Butler & Associates

Marvel Industries, Inc. 134
Agency-Vernon S. Weiler

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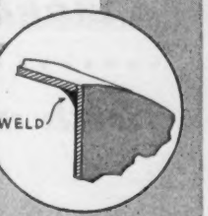
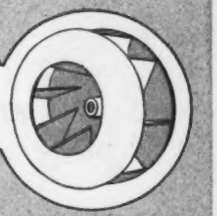


Ample gauges, strong bracing, parts predominantly welded. Housing seams welded to assure tightness.

Sound Design



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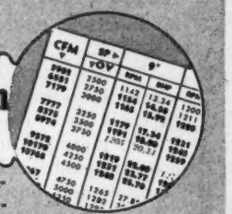

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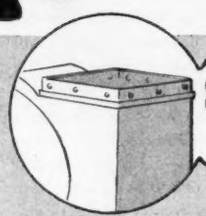

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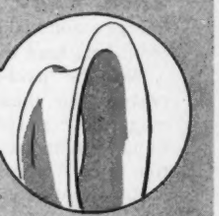

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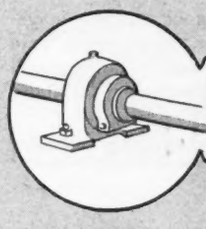

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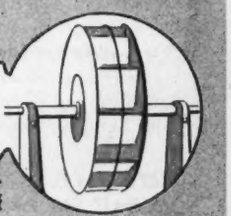

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Mason-Neilan Regulator Co. 99, 100, 101, 102
Agency-Sutherland-Abbott

Mateer Co., G. Diehl 144
Agency-The Buckley Organization

Mathieson Chemicals 45
Agency-Doyle, Kitchen & McCormick, Inc.

Merco Centrifugal Co., Affiliate of The Merrill Company 172
Agency-John O'Rourke Advertising

Metallizing Engineering Co., Inc. 116
Agency-The Schuyler Hopper Co.

Metal Textile Corporation 98
Agency-Richard La Fond Advertising Inc.

Metalsmiths Division of Orange Roller Bearing Co., Inc. 236
Agency-Thoma & Gill

Milton Roy Company 80
Agency-The Aitkin-Kynett Co.

Mixing Equipment Co., Inc. ..... 3rd Cover
Agency-Charles L. Rumrill & Co., Inc.

Moisture Register Co. 96
Agency-Willard G. Gregory & Co.

Monsanto Chemical Company 56, 57
Agency-Gardner Advertising Co.

Morehouse-Cowles, Inc. 203
Agency-Willard G. Gregory & Co.

Morningstar, Nicol, Inc. 53
Agency-The Vanden Company Inc.

Morris Machine Works 128
Agency-Barlow Advertising Agency, Inc.

Murray Manufacturing Co., D. J. 248
Agency-R. C. Breth Inc.

N

National Airoil Burner Co., Inc., Chemical-Petroleum Division 180
Agency-R. E. Lovekin Corporation

National Aniline Division, Allied Chemical & Dye Corporation 47, 51
Agency-James J. McMahon, Incorporated

National Carbon Company, A Division of Union Carbide and Carbon Corporation 162
Agency-William Esty Company, Inc.

National Distillers Products Corporation, U. S. Industrial Chemicals Co., Division ..... Opp. 42
Agency-G. M. Basford Company

National Drying Machinery Co., The 224
Agency-George C. Taylor

National Starch Products Inc., Resin Division 63
Agency-G. M. Basford Company

National Tube Division, United States Steel Corporation 152, 153
Agency-Batten, Barton, Durstine & Osborn, Incorporated

Neff & Fry Co., The 134
Agency-The Parker Advertising Company

Neptune Meter Company 88
Agency-W. L. Towne Advertising

Neville Chemical Co. 4th Cover
Agency-The Advertising Agency of William Cohen

Newark Wire Cloth Company 246
Agency-Sanger-Funnell, Incorporated

Niagara Alkali Company 49
Agency-Hazard Advertising Company

Niagara Blower Company 234
Agency-The Moss-Chase Company

Niagara Filters, A Division of American Machine and Metals, Inc. 214
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

Nichols Engineering & Research Corp., Nerco-Niro Spray Dryer Division 262
Agency-The Stuart Company

Nitrogen Division, Allied Chemical & Dye Corporation 53
Agency-Atherton & Currier, Inc.

Norton Company 19
Agency-James Thomas Chirurg Company

Norwalk Company, Inc. 138
Agency-Robert H. Ramage

O

Oilgear Company, The 27
Agency-Kirkgasser-Drew

Olin Mathieson Chemical Corporation, Industrial Chemicals Division 45
Agency-Doyle, Kitchen & McCormick, Inc.

P

Palmer-Shile Co. 124
Agency-Alfred B. Caldwell, Inc.

Pawtucket Manufacturing Company 198
Agency-Horton-Noyes Company

Peabody Engineering Corporation 240
Agency-Richard LaFond Advertising Inc.

Peerless Electric Co., The, Electronics Division 94
Agency-Meek and Thomas, Inc.

Peerless Pump Division, Food Machinery & Chemical Corporation 121
Agency-The McCarty Company

Pennsylvania Industrial Chemical Corp. 53
Agency-Walker & Downing

Perfecting Service Company 182
Agency-E. J. Presser and Co.

Permutit Company, The 98
Agency-Cunningham & Walsh Inc.

Pfaudler Co., The 160
Agency-Charles L. Rumrill & Co., Inc.

Philadelphia Gear Works Incorporated 211
Agency-R. E. Lovekin Corporation

Philadelphia Pump and Machinery Company, Subsidiary of American Meter Company 32, 33
Agency-The Michener Company

Pioneer Rubber Company, The 166
Agency-Carr Liggett Advertising, Inc.

Pipe Line Development Co., The 22
Agency-The W. N. Gates Company

Pla-Tank, Inc., Division of The Chemical Corporation 178
Agency-Wm. B. Remington Inc.

Potts Company, Horace T. .. 232
Agency-The Roland G. E. Ullman Organization

Powers Regulator Company, The 226
Agency-Symonds, MacKenzie & Company, Inc.

Precision Scientific Co. 103
Agency-Reincke, Meyer & Finn Incorporated

Precision Thermometer & Instrument Co. 154
Agency-Benham Advertising

Pressed Steel Co., The 196
Agency-Wilbur A. Myers

Pritchard & Co. of California, J. F., A Division of J. F. Pritchard & Co. .. 209
Agency-Carter Advertising Agency, Inc.

Proctor & Schwartz Inc. 256
Agency-Robert S. Kampmann, Jr.

Propellair, Division of Robbins & Myers, Inc. 250
Agency-Greenbaw & Rush, Inc.

Protective Lining Corp. 113
Agency-Alan Rock Advertising

Protectoseal Company, The 175
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

Putman Publishing Company .. 194, 204, 226, 256, 264, 266

R

Raybestos-Manhattan, Inc., Packing Division 222
Agency-Gray & Rogers

Raymond Division, Combustion Engineering, Inc. 265
Agency-Wamsley and Heer, Inc.

Reliance Electric and Engineering Company 28
Agency-Wellman, Buschman and Hines Incorporated

Research-Appliance Company 137
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

Revere Copper and Brass Incorporated 187
Agency-St. Georges & Keyes, Inc.

Richardson Scale Company .. 143
Agency-O. S. Tyson and Company, Inc.

Robbins & Myers, Inc. 260
Agency-Erwin, Wasey & Company, Inc.

Rochester Manufacturing Company, Inc. 98
Agency-Hutchins Advertising Company

Rockwell Manufacturing Company 108
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

Rockwell Company, W. S. 188, 208
Agency-Spooner & Kriegel

Roper Corporation, Geo. D. 226
Agency-Cummings, Brand & McPherson

Ross Engineering Corporation, J. O. 69
Agency-Alexander Ross Agency

S

Safety Car Heating and Lighting Company, Inc., The, Entoleter Division .. 163
Agency-J. C. Bull Inc.

Saran Lined Pipe Company 121
Agency-MacManus, John & Adams, Inc.

Sarco Company, Inc. 181
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

Sawyer & Son Co., The H. M. 167
Agency-Shattuck, Clifford & McMillan, Inc.

Schutte and Koerting Company 35
Agency-Harris D. McKinney Incorporated

Schutz-O'Neill Company 229
Agency-Foulke Agency, Inc.

Scott Aviation Corp., Safety Equipment Division 167
Agency-Melvin F. Hall Advertising

Semet-Solvay Petrochemical Division, Allied Chemical & Dye Corporation 54
Agency-Atherton & Currier, Inc.

Sharples Corporation, The .. 115
Agency-Renner Advertisers

Shriver & Company, Inc., T. 210
Agency-Spooner & Kriegel

Sier-Bath Gear & Pump Co., Inc. 202
Agency-Thoma & Gill

Simplex Valve and Meter Company 180
Agency-Cunningham & Walsh Inc.

Sindar Corporation 74
Agency-Hazard Advertising Company

Sly Manufacturing Co., The W. W. 8
Agency-The Bayless-Kerr Company

Smith Corporation, A. O. 76, 77
Agency-Klau-Van Pietersom-Dunlap, Inc.

Solvay Process Division, Allied Chemical & Dye Corporation 67
Agency-Atherton & Carrier, Inc.

Sonneborn Sons, Inc., L., White Oil & Petrolatum Division 43
Agency-St. Georges & Keyes, Inc.

Sparkler Manufacturing Company 141
Agency-Kreicker & Meloan, Inc.

Speedline Stainless Steel Fittings Division, Horace T. Potts Company 232
Agency-The Roland G. E. Ullman Org.

Spence Engineering Company, Inc. 95
Agency-Michel-Cather Inc.

Sperry & Co., D. R. 146
Agency-Illinois Simmonds & Simmonds Incorporated

Spraying Systems Co. 148
Agency-Advertising Producers-Associated

Standard Conveyor Company 132
Agency-Klau-Van Pietersom-Dunlap, Inc.

Standard Oil Company (Indiana) 117
Agency-D'Arcy Advertising Company

Stephens-Adamson Mfg. Co., Standard Products Division 135
Agency-Connor Associates, Inc.

Sterling Electric Motors 202
Agency-Heintz & Co., Inc.

Strahman Valves, Inc. 138
Agency-Picard, Marvin & Redfield

Strong, Carlisle & Hammond Co. 178
Agency-The Jayme Organization Inc.

Sturtevant Mill Company 189
Agency-Sutherland-Abbott

Sun Oil Company 60
Agency-Ruthrauff & Ryan Inc.

Surface Combustion Corporation 177
Agency-Odiorne Industrial Advertising

Swift & Company, Industrial Oil Dept. 237
Agency-Russell T. Gray, Inc.

Swift Glass Division, Swift Lubricator Company, Inc. 137
Agency-Taylor M. Ward, Inc.

Sylvania Electric Products Incorporated, Tungsten & Chemical Division 52
Agency-J. Walter Thompson Company

T

Taber Instrument Corporation 92
Agency-The Pursell Company

Taber Pump Co. 163
Agency-Tyler Kay Company, Inc.

Taylor Instrument Companies 104
Agency-Batten, Barton, Durstine & Osborn, Incorporated

Taylor-Stiles and Company .. 256
Agency-S. M. Ferrer

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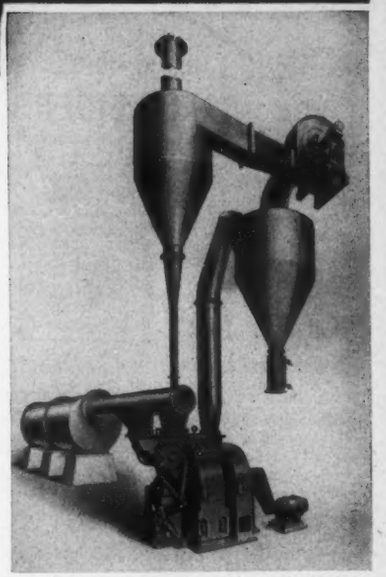

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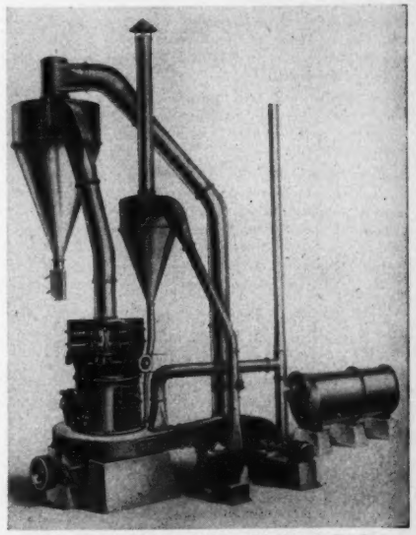

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When inquiring check CP 1703 opposite last page

Tennessee Coal & Iron Division, United States Steel Corporation 152, 153
Agency-Batten, Barton, Durstine & Osborn, Incorporated

Tennessee Corporation 52
Agency-Crawford & Porter, Inc.

Thermal Research & Engineering Corp. 186
Agency-Braun & Miller, Advertising

Thomas Publishing Company 232
Agency-W. N. Hudson, Advertising

Tolhurst Centrifugals, A Division of American Machine and Metals, Inc. 215
Agency-Marsteller, Richard, Gebhardt and Reed, Inc.

Treen Box Company 132
Agency-Nat M. Kolker Advertising

Trent, Inc. 240, 246
Agency-The Roland G. E. Ullman Org.

Tropical Paint Company, Subsidiary of Parker Rust Proof Co. 149
Agency-The Fred M. Randall Company

Tube Turns, A Division of National Cylinder Gas Company ..... Opp. 18
Agency-The Griswold-Eshleman Co.

Tube Turns Plastics, Inc. 112
Agency-The Griswold-Eshleman Co.

Turbo-Mixer Division, General American Transportation Corporation 18
Agency-Weiss and Geller, Inc.

U

Union Carbide and Carbon Corporation, Carbide and Carbon Chemicals Company 39
Agency-J. M. Mathes, Incorporated

Union Carbide and Carbon Corporation, Carbide and Carbon Chemicals Company, Textile Fibers Dept. 175
Agency-Anderson & Cairns, Inc.

Union Carbide and Carbon Corporation, National Carbon Company 162
Agency-William Esty Company, Incorporated

Union Special Machine Company 236
Agency-Armstrong Advertising

United Chromium Division, Metal & Thermit Corporation 118
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

U. S. Industrial Chemicals Co., Division of National Distillers Products Corporation ..... Opp. 30
Agency-G. M. Basford Company

U. S. Stoneware, Plastics and Synthetics Division 158, 245
Agency-Ralph Gross Advertising, Inc.

U. S. Stoneware, Process Equipment Div. 160
Agency-Ralph Gross Advertising, Inc.

United States Gasket Company 84
Agency-The Michener Company

United States Rubber Company, Mechanical Goods Division 147
Agency-Fletcher D. Richards, Inc.

United States Steel Corporation 152, 153
Agency-Batten, Barton, Durstine & Osborn, Incorporated

United States Steel Export Company, United States Steel Corporation 152, 153
Agency-Batten, Barton, Durstine & Osborn, Incorporated

United States Steel Supply Division, United States Steel Corporation 152, 153
Agency-Batten, Barton, Durstine & Osborn, Incorporated

V

Valdura Paint Division, American-Marietta Co. 120, 180
Agency-Turner Advertising

Vanton Pump & Equipment Corp., Division of Cooper Alloy Corporation 220
Agency-Mahool Advertising, Inc.

Vapor Heating Corporation .. 208
Agency-William Hart Adler, Inc.

Vapor Recovery Systems Company, The 90
Agency-The McCarty Company

Virginia Gear & Machine Corp. 211
Agency-R. E. Lovekin Corporation

Vulcan Containers, Inc. 128
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

W

Wagner Electric Corporation 183
Agency-Arthur R. Mogge

Wall Colmonoy Corporation 192
Agency-A. Hemsing Advertising

Watson-Stillman Company, The, Division of H. K. Porter Company, Inc. 159
Agency-St. Georges & Keyes, Inc.

Waukesha Foundry Company 199
Agency-The Cramer-Krasselt Co.

Wellington Sears, A Subsidiary of West Point Manufacturing Company .. 185
Agency-Ellington & Company, Inc.

West Virginia Pulp & Paper Co. 53
Agency-G. M. Basford Company

Wheelco Instruments Division, Barber-Colman Company 92
Agency-Howard H. Monk & Associates, Inc.

Wiegand Company, Edwin L. 213
Agency-Ketchum, MacLeod & Grove, Inc.

Williams & Co., C. K. 66
Agency-Emery Advertising Corp.

Williams Gauge Co., Inc., The 87
Agency-Walker & Downing

Wilson, Inc., Thomas C. 252
Agency-Michel-Cather, Inc.

Worthington Corporation, Steam Turbine Division 75
Agency-James Thomas Chirurg Company

Wyandotte Chemicals Corporation, Inquiry Section 78, 79
Agency-Brooke, Smith, French & Dorrance, Inc.

Wyandotte Chemicals Corporation 44
Agency-Brooke, Smith, French & Dorrance, Inc.

Y

Yale & Towne Mfg. Co., The 133
Agency-Ruthrauff & Ryan, Inc.

Yarnall-Waring Company 205
Agency-The Michener Company

York Process Equipment Corp. 132
Agency-Ray Ellis Advertising

Young Brothers Company 218
Agency-Allied Advertising Agency, Inc.

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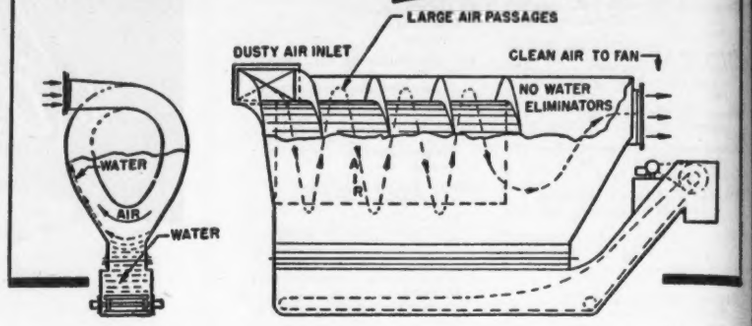

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✓	Key	Description
☐	1000a	Boron Trifluoride (general information)
☐	1000b	Boron Trifluoride (state application)
☐	1001	Latex
☐	1002a	Ethylene Glycols, Dichloride
☐	1002b	Ethanolamines
☐	1002c	Nonyl Phenol
☐	1002d	Morpholine
☐	1002e	Ethylene, Propylene and Glycerine Carbonates
☐	1002f	Polyethylene Glycols
☐	1002g	Ethylene Oxide
☐	1003	Pressure Filter
☐	1004	Dust Filter & Collector
☐	1005	Zinc Coating
☐	1006	Reusable Insulation
☐	1006A	Quadruple-effect Evaporators
☐	1007	Mixers
☐	1008	Ethylene for Petrochemicals
☐	1009	Chlorinators
☐	1009A	Incinerator
☐	1009B	Saran-lined Pipe
☐	1010a	Welded Fittings and Flanges
☐	1010b	Pipe and Fittings Material
☐	1011	Seamless Paraus Tubes
☐	1012	Protective Coatings
☐	1012A	Chlorinated Rubber
☐	1013a	Feed Water Heaters
☐	1013b	Boiler Control Panels
☐	1013c	TV Cameras
☐	1013d	Coordinated Precision Technology
☐	1014	Dewatering
☐	1015	Line Blind Valve
☐	1016a	Welding Coupling
☐	1016b	Pipeline Clamp
☐	1017	Dust Collectors
☐	1018	Piston-diaphragm Pump
☐	1019a	Roller Mills
☐	1019b	Grinding Mills
☐	1019c	Kilns, Dryers & Coolers
☐	1019d	Vibrating Screens
☐	1019e	Compacting Mills
☐	1019f	Gyratory Screens
☐	1019g	Man Lifts
☐	1020	Vibrating Feeders
☐	1021	Power-house Equipment Cleaning
☐	1022	Shipping Containers
☐	1023a	Plug Valves
☐	1023b	Lubricants
☐	1024	Metal Fabrications
☐	1025	3-Roll Paint Mill
☐	1026	Magnetic Trap
☐	1027	Fluid Drives
☐	1028	Motor
☐	1029	Polyethylene Tape
☐	1030	Aluminum Tanks
☐	1031	Diaphragm Valve
☐	1032	Graphic Wattmeters
☐	1032A	Stainless Centrifugal Pump and Tube
☐	1033a	Polyethylene Resins (state which)
☐	1033b	Titanium
☐	1033c	Fatty Alcohol
☐	1033d	Sodium
☐	1033e	Methionine
☐	1033f	Technical Developments (state which)
☐	1034	High-pressure Heat Exchanger Sections
☐	1035	Hydrogen Valve
☐	1036a	Proportioning Pump
☐	1036b	Chemical Feeder
☐	1036c	Automatic Control Feeder
☐	1036d	Differential-pressure Pumps
☐	1037	Neoprene Coating
☐	1038	V-belts
☐	1039	Filter
☐	1040	Non-rising Gate Valve
☐	1041a	Jet Fume Scrubber
☐	1041b	Jet Apparatus Applications
☐	1042	Gate Valves
☐	1043	Positive-displacement Pumps
☐	1044a	Cyclohexanone
☐	1044b	Crystal Urea
☐	1044c	Adipic Acid
☐	1044d	Hydroxyacetic Acid
☐	1044e	Cyclohexanol
☐	1044f	Fatty Alcohols
☐	1044g	Diglycolic Acid
☐	1044h	Methanol
☐	1045	Acrolein Derivatives (state which)
☐		Acid
☐	1046	Ethylenediamine Tetraacetic
☐	1047	Flocculating Reagents
☐	1048	Modified Styrene Resin
☐	1049	Preservatives
☐	1050	12-Hydroxy Stearic Acid
☐	1051	Linseed-resin Copolymer
☐	1052	Surface-active Agents
☐	1054	Glycol Ethers
☐	1056a	White Oils
☐	1056b	Petrolatums
☐	1057	Chemical Raw Materials (state problem)
☐	1058	Vinyl Chloride Resins
☐	1059	Hydroxyadipaldehyde
☐	1060	Fluorochemical Paper-sizing Agent
☐	1061	Synthetic Organic Pharmaceutical Chemicals
☐	1062	Ethanolamines
☐	1063	PVC Resins
☐	1064	Cationic Softener
☐	1065	Organic Intermediates
☐	1066	Plasticizer for PVC
☐	1067	Amine Curing Agent
☐	1068	Di Iso Decyl Phthalate
☐	1069a	"Nacconates"
☐	1069b	Nacconate 80
☐	1069c	Nacconate 65
☐	1069d	Nacconate 100
☐	1069e	Nacconate 200
☐	1069f	Nacconate 300
☐	1070a	Acetic Acid
☐	1070b	Acetic Anhydride
☐	1070c	Propionic Acid
☐	1070d	Propionic Anhydride
☐	1070e	Butyric Acid
☐	1070f	Butyric Anhydride
☐	1071	Polycapramide Nylon
☐	1072	Wax Beads
☐	1073	Fatty Acids
☐	1074	Furnace Blacks
☐	1075	Aminotriazole
☐	1076a	Carbonate of Potash
☐	1076b	Caustic Potash
☐	1076c	Liquid Chlorine
☐	1076d	Caustic Soda
☐	1076e	Paradichlorobenzene
☐	1076f	Tetrachloro Phthalic Anhydride
☐	1076g	Trichlorethylene
☐	1077	Nitroparaffins
☐	1078	Didecyl Phthalate Plasticizer
☐	1079	Industrial Deodorants
☐	1080	Aluminum Pastes
☐	1081	Thiodiglycolic Acid
☐	1082	MoS2 Flakes as Lubricant
☐	1083	Caprolactam
☐	1084	Chemicals (state which)
☐	1085	Solvent Recovery
☐	1086	High-purity Chemicals (state use)
☐	1087	Urethane Foams
☐	1088	Phenolic Varnish for Laminates
☐	1089	Surface-active Agents
☐	1090	Gelling, Thickening Agents
☐	1091	Resins (state application)
☐	1092	Polyethylene (state application)
☐	1093	Blowing Agent for Vinyls
☐	1094	Styrene Molding Compounds
☐	1094A	Pigmentation of Butadiene-styrene Latex Paints
☐	1095	Isophorone
☐	1096	Casting Resin
☐	1097	Urea Formaldehyde Concentrate
☐	1098	Organic Chemicals
☐	1099	Pentaerythritol
☐	1100	Diethylene Glycol Mono Laurate
☐	1101	Vinyl Resin
☐	1102	Blue Tetrazolium
☐	1103a	Special Surface Coating Process
☐	1103b	Lubricant Additives
☐	1103c	Hydraulic Fluid
☐	1103d	Dibutyl Fumarate
☐	1103e	Plasticizer
☐	1104	Sulfur Dioxide
☐	1105	Modified Ammonium Polyacrylate Solution
☐	1106	Casting Wax
☐	1107	Activated Carbon
☐	1108	Alumina
☐	1109	Propylene Trimer
☐	1110	Silicone Resins
☐	1111	Partially-neutralized Succinic Acid
☐	1112	Channel Black for Inks
☐	1113	Pyrethrum Insecticide
☐	1114	Castor Oils and Derivatives
☐	1115	Silica Gel
☐	1117	Snythetic Polysaccharides
☐	1118	Paraffin and Microcrystalline Waxes
☐	1119	Water-soluble Resins
☐	1120	Sodium Silicate
☐	1121	Polyvinyl Acetate Copolymers (state application)
☐	1123	Resins
☐	1123A	Ethylene Polymer
☐	1124	Thixotropic Resin
☐	1125	Formaldehydes
☐	1126	Magnesia (state application)
☐	1127	Silicone Gums
☐	1128	Gluconic Acid and Derivatives
☐	1129	Red Colors and Pigments
☐	1130	Bonding Material
☐	1131	Edible Colloids
☐	1132	Chemical Industries Exposition
☐	1133	Sodium Nitrite
☐	1134a	Vacuum Pumps (state use)
☐	1134b	Vacuum Pumps
☐	1135	Drying Equipment
☐	1136	Filler
☐	1137a	Reclamation Systems
☐	1137b	"Industrial Applications"
☐	1137c	Laboratory Tests
☐	1137d	Product Tests (state which)
☐	1138a	Plastic Fabrication
☐	1138b	Plastic Ducting
☐	1139	Screens
☐	1140	Dryer
☐	1141a	Antifoam A
☐	1141b	Antifoam AF Emulsion
☐	1142	High-pressure Valves
☐	1143	Metal Grating
☐	1144	Industrial Aromatics
☐	1145	Steam Turbines
☐	1146a	Heat Exchangers
☐	1146b	Pressure Vessels
☐	1146c	Process Equipment
☐	1147	Canned Motor-pump
☐	1148	European Research Services
☐	1149	Pelletizing Discs
☐	1150a	Pluronics in Shampoos
☐	1150b	Pluronics (state application)
☐	1151	Transparent Document Holders
☐	1152	Controlled-volume Pumps
☐	1153	Ultrasonic Vibrators
☐	1154	Porcelain Valves
☐	1155	Bleaching Process
☐	1157	Coconut Oil Fatty Acids & Methyl Esters
☐	1158	Synthetic Ammonia Process
☐	1159	Anti-foam Agent (state use)
☐	1160	Teflon Mechanical Seal
☐	1161	Aptitude Measurement Kits
☐	1162	Cleanser
☐	1163	Fertilizer Plant
☐	1164	Oil-lubricated Pumps
☐	1165	Lubricants
☐	1166	Management Programs
☐	1167a	Sodium
☐	1167b	Hydrogen Peroxide
☐	1167c	Vinyl Polymer
☐	1167d	Methylene Chloride
☐	1167e	Pyrrolidine
☐	1167f	Dihydropyran
☐	1168	Viscometers
☐	1169	Water Treatment
☐	1170	Standards
☐	1171	Silent Check Valve
☐	1172	Liquid Meter
☐	1173	Controlling Crusher Feed
☐	1174a	Level Control
☐	1174b	Electronic Temperature Control
☐	1174c	Resistance Thermometer Recorder
☐	1174d	Proximity Meter
☐	1175	Automatic Tank Gage
☐	1176	Air Filters
☐	1177	Differential-pressure Meters
☐	1178	Electrical Timers
☐	1179	Waste-treatment Controllers
☐	1180a	Manual Starter
☐	1180b	Solenoid Starter
☐	1181	Temperature Controller
☐	1182	Temperature Probes
☐	1183	Pressure Transmitter
☐	1184	Proportioners
☐	1185	Timing Controller
☐	1186	Oxygen-combustibles Analyzer-recorder
☐	1187	Explosion-proof Liquid Meter
☐	1188	Liquid-level Controller
☐	1189	Thermocouple Circuit Monitors
☐	1190	Relay Kit
☐	1191	Slurry Control System
☐	1192	Temperature Regulator
☐	1193	Moisture Register (state requirement)
☐	1194	Time Switch
☐	1195	Liquid Meters
☐	1196	Electronic Equipment
☐	1197	Control Valves
☐	1198	Infrared Analyzer
☐	1199	Air-operated Controllers
☐	1200	Mist Eliminator
☐	1201	Temperature Controller
☐	1202	Dial Thermometer
☐	1203	Gas Analyzer
☐	1204	pH Controller
☐	1205a	Liquid-level Controllers
☐	1205b	Pneumatic Transmitters
☐	1205c	Instrument Mountings
☐	1205d	Mounting Connections
☐	1205e	Displacers
☐	1205f	Tube Housing Extensions
☐	1205g	Electronic Transmitters
☐	1206	Chlorine Flow Meter
☐	1207	Control Switch
☐	1208	Instrument Chart
☐	1209	Temperature Indicators
☐	1210	Impulse Contactors
☐	1211	Water Still
☐	1212	Reactor Control Systems
☐	1213	Liquid Flow Meter
☐	1214	Line Current Tester
☐	1215	Cycle Controllers
☐	1216a	Vacuum Controller
☐	1216b	Vacuum Gages
☐	1217	Plastic Pipe, Fittings & Fabrications
☐	1218	Stainless Steel Blower
☐	1219	Plastic-coated Wire Rope
☐	1220	Corrosion-resistant Coatings
☐	1221	Lined Pails
☐	1222	Glassed-steel Tank Trailers
☐	1223	Chemical Pumps
☐	1224	Liquid Meters
☐	1225	Plastic Dip Pipe
☐	1226	Speed Reducer
☐	1227	Industrial Adhesives (state application)
☐	1228	Corrosion-resistant Duct
☐	1229	Teflon Fabrications (state which)
☐	1230	Cast Iron Alloys
☐	1231	Epoxy Coatings
☐	1232a	Fluorocarbon Plastic
☐	1232b	Plastic Dispersions
☐	1233a	Rubber Pipe
☐	1233b	Ducting
☐	1233c	Flanges
☐	1234	Odorless Coatings
☐	1235	Plastic Containers
☐	1236	PVC Fittings & Flanges
☐	1237	Primer Coating
☐	1238	Protective Coatings
☐	1239	Plastic Drum, Bag & Carton Liners
☐	1240	Corrosion-resistant Pipe
☐	1241	Water Treatment
☐	1242	Titanium Inserts
☐	1242A	Titanium Sponge
☐	1243	Solid Plastic Fans
☐	1244	Crystal Dehydration
☐	1245	Protective Coatings
☐	1246	Graphite Heat Exchangers
☐	1247	Stainless Valves
☐	1248	Corrosion-resistant Fasteners
☐	1249	Corrosion-resistant Fittings
☐	1250	Teflon Agitators
☐	1251	Clad Metal
☐	1252	Lubricant
☐	1253	Protective Coatings
☐	1254	Plastics
☐	1255	Protective Coating
☐	1256	Glass Pipe
☐	1257	Water Treating System
☐	1258	Stainless Steel
☐	1259a	Plastic-lined Pipe
☐	1259b	Plastic-lined Fittings
☐	1259c	Plastic-lined Valves
☐	1260a	Latex Paint
☐	1260b	Heavy-duty Enamel
☐	1261	Aluminum Oxide Coatings
☐	1262	Nickel Alloy Tubing
☐	1263	Plastic Pipe
☐	1264	Foundry Castings
☐	1265	Hydraulic Fluid Packing
☐	1266	Zinc
☐	1267	Can-type Vertical Pump (state which)
☐	1268a	Kettles
☐	1268b	Process Equipment Service
☐	1269	Stainless Fittings
☐	1270	PVC Tube
☐	1271	Corrosion-proof Motor
☐	1272	Refractories
☐	1273	Material Handling Equipment
☐	1274	Air-conveying Systems
☐	1275	Gas Fork Truck
☐	1276	Chute Magnet
☐	1277	Visual Control
☐	1278	Manway
☐	1279	Weight Totalizer
☐	1280	Terminal Facilities
☐	1281	Oscillating Conveyor
☐	1282	Slurry Pump
☐	1283	Steel Pails and Drums
☐	1284	Tank Truck
☐	1285	Liquid Meter
☐	1286a	Tractor Shovel
☐	1286b	2-Wheel-drive Shovel
☐	1286c	4-Wheel-drive Shovel
☐	1286d	Towing Tractor
☐	1287	Aluminum Ladders
☐	1288	Cylinder-handling Truck
☐	1289	Monorail Hoist
☐	1290	Industrial Storage Bins
☐	1291	Shipping Containers
☐	1292	Natural-frequency Conveyor
☐	1293	Conveyors
☐	1294	Bucket Cranes
☐	1295	Dry Feeders
☐	1296	Truck Scale
☐	1297	Solvent Extraction Columns
☐	1298	Carboy Boxes
☐	1299	Vibrators
☐	1300	Lift Truck
☐	1301	Casters & Wheels
☐	1302	Automatic Sacker
☐	1303	Fork Truck
☐	1304	Drum-handling Attachment
☐	1305	Concrete Storage Bin
☐	1306	Vibrating Screens
☐	1307	Auto-Scoop Loader
☐	1308	Box Car Loaders
☐	1309	Vibrating Conveyor
☐	1310	Magnetic Separator
☐	1311	Plastic Pallet
☐	1312	Drum Dumper
☐	1313	Liquid-level and Industrial Controls
☐	1314	Micro-bellows Pump
☐	1315	Tubular Gage Glass & Glass Cylinder
☐	1316	Strapping Containers
☐	1317	Pallet Rollers
☐	1318	Storage
☐	1319	Electric Fork Truck
☐	1320	Compressors
☐	1321	Industrial Pump
☐	1322	Drain Valves
☐	1323	Air and Electric Vibrator
☐	1324	Strain Gages
☐	1325	Corrugated and Fiber Boxes
☐	1326	Stainless Tubing & Pipe
☐	1327	Organic Solvents

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See additional products and services on reverse side ——→

READER SERVICE SLIP

(Continued from reverse side of this sheet).

OCTOBER, 195

For more information on processes, controls or developments of products . . . note key number of staff-written editorial articles and advertisements that interest you . . . verify the key on this sheet . . . check space provided . . . fill in your name, title, company, main product and address below . . . mail to publisher's Reader Service Dept.

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✓	Key	Description
☐	1328	Acetylenic Compounds
☐	1329	Paint and Varnish
☐	1330	Horizontal Plate Filter
☐	1331	Closures
☐	1332	Portable Bag Closer
☐	1333	Bagging Scale
☐	1334	Fillers
☐	1335	Aerosol Research
☐	1336	Bench Model Labeler
☐	1337	Package Seals
☐	1338	Metal Fabrication
☐	1339	Detergent-filling Machine
☐	1339A	Case Packer and Sealer
☐	1340	Cast Heaters
☐	1341	"P" Style Cans
☐	1342	Waterproof Bags
☐	1343	Metal Cans
☐	1344	Bagging Machine
☐	1345	Filter Press Closer
☐	1346	Liquid Tank Gage
☐	1347	Polyethylene Extruder
☐	1348	Packaging Film
☐	1349	Corrosion-resistant Linings
☐	1350a	Pressure-sensitive Labels
☐	1350b	Electric Label Dispenser
☐	1351	Spray Nozzle
☐	1352	Time Recorder-Totalizer
☐	1353	Rubber-base Paints
☐	1354	Metal Grating
☐	1355	Corrugated Board
☐	1356	Bagging Scale
☐	1357	Protective Coatings
☐	1358	Rotary Sifters
☐	1359a	Aluminum Tanks
☐	1359b	High-pressure Vessels
☐	1360	Cyclones
☐	1361	Drum Dryers
☐	1362	Mineral Processing Plant
☐	1363	Vacuum Forming Machine
☐	1364	Stainless Processing Equipment
☐	1365	Crusher
☐	1366	Self-starting Vibrators
☐	1367	Treated Cotton Filter Cloth
☐	1368	Cyclone Classifier
☐	1369	Ball Valves
☐	1370	Liquid Density Controller
☐	1371	Finned Tube
☐	1372	Glassed-steel Dryer
☐	1373	Strainers
☐	1374	Process Equipment Fabrication
☐	1375	Applications of Aluminum
☐	1376	Desineralizers
☐	1377	Bailing Drums
☐	1378a	Power & Processing Equipment (state which)
☐	1378b	Manufacturing & Maintenance Service (state requirements)
☐	1379	Filter-leaf Shut-off
☐	1380	Centrifugal Mixer
☐	1381	Flaker
☐	1382	Plastic Tubing
☐	1383	Water Softeners
☐	1384	High-pressure Intensifier Unit
☐	1385	Stainless Heat Exchanger
☐	1386	Pulverizers
☐	1387	Gyratory Screens
☐	1388	Industrial Ovens
☐	1389	Porcelain Containers
☐	1390	Liquid Cyclones
☐	1391	Stainless Plastics Dryer
☐	1392a	Pumps
☐	1392b	Pipe & Fittings
☐	1392c	Heat Exchangers
☐	1392d	Cascade Coolers
☐	1392e	HCl Absorbers
☐	1393	Polyethylene Tower Packing
☐	1394	Pumps
☐	1395	Synthetic Filter Felts
☐	1396	Hydraulic Closing Device
☐	1397	Impact Mill
☐	1398	Insulated Wire
☐	1399	Dust Sampler
☐	1400	Safety Apparel
☐	1401a	Expansion Joints
☐	1401b	Teflon-lined Bellows
☐	1402	Indicating Controller
☐	1403	Industrial Gloves
☐	1404	Protective Clothing
☐	1405	Fire Extinguisher
☐	1406	Level Control
☐	1407	Respirator
☐	1408	Automatic Sprinklers
☐	1409	Safety Door
☐	1410	Tube Fittings
☐	1411	Solenoid Valve
☐	1412a	Glycerine for Product Conditioning
☐	1412b	Glycerine Standards and Specifications
☐	1412c	Glycerine Properties and Applications
☐	1413	Industrial Hearing
☐	1414	Safety Goggles
☐	1415	Extinguisher
☐	1416	Flame Retardant Coatings
☐	1417a	Safety Hood
☐	1417b	Eye Shields
☐	1417c	Respirators
☐	1418	Gas Indicator
☐	1419	Heat-resistant Decals
☐	1420	Centrifuge
☐	1421	Portable Resuscitators
☐	1422	Automatic Dry Chemical Fire Protection
☐	1423	Filter Aids
☐	1424	Fire Extinguishers
☐	1425	Safety Container
☐	1426	Fire Alarm
☐	1427	Chemical-resistant Work Clothing
☐	1428	Silicate Stone Sinks
☐	1429	Moisture Testers
☐	1430	Burn-rate Propellants
☐	1431	Vapor-pressure Bombs
☐	1432	Humidity Conditioning
☐	1433	Steam Traps
☐	1434	Dust Systems
☐	1435	Constant-weight Balances
☐	1436	Molecular Filters
☐	1437	Brinemakers
☐	1438	Flow-indicating Flume
☐	1439	Pressure & Vacuum Controller
☐	1440	Gas Analyzers
☐	1441	Tandem Combustion Units
☐	1442	All-electronic Spectrograph
☐	1443	Thermodynamic Steam Trap
☐	1444a	Alkyd Interior Paint
☐	1444b	Latex Paint
☐	1445	Infra-red Water Bath
☐	1446a	Eye-wash Fountain
☐	1446b	Goggle-wash Fountain
☐	1447	Steam Traps
☐	1448	Laboratory Benches
☐	1449	Micro Pumps
☐	1450	Totally-enclosed Fan-cooled Motors
☐	1451	Dryers and Heaters
☐	1452	Ultrasonic Emulsifiers
☐	1453	Laboratory Ovens
☐	1454	Mitre Gear Units
☐	1455	Gas Analyzers
☐	1456	Filter Fabric
☐	1457	Direct-fired Air Heater
☐	1458	Acid-proof Cements
☐	1459	Chemical Predictor
☐	1460	Gelometers
☐	1461	Copper Fabrications
☐	1462	Ovens
☐	1463	Spray Nozzles
☐	1464	Humidity Cabinet
☐	1465	Laboratory Press
☐	1466	Temperature Indicator-controller
☐	1467	Micro-rheometers
☐	1468a	Dry-batch Blender
☐	1468b	Grinding Machine
☐	1468c	Ring-roll Mill
☐	1468d	Air-separator
☐	1468e	Swing-sledge Mill
☐	1469	Continuous String Filters
☐	1470	Teflon Pump Seal
☐	1471	Spraywelding
☐	1472	Blowers
☐	1473	Plug Valve
☐	1474	Wire Cloth & Fabrication
☐	1475	Heavy-duty Pumps
☐	1476	PVC Fittings and Adapters
☐	1477	Pipe Insulation
☐	1478	Process Pipe
☐	1479	High-pressure Reciprocating Pumps
☐	1480	Flexible Ball Joints
☐	1481	Tube Fittings
☐	1482	Color-difference Meter
☐	1483	Relief Valve
☐	1484	Centrifugal Compressors
☐	1485	Filters (state which)
☐	1485a	Stainless Fittings
☐	1485b	Slide Rule
☐	1487	Splitting Machine
☐	1488	Bolts, Nuts, Studs
☐	1489	Pipe Insulation
☐	1490	Blower-exhausters
☐	1491	Sanitary Pump
☐	1492	Proportioning Pump
☐	1493	High-temperature Tubing
☐	1494	Carbon Brushes
☐	1495	Square O-rings
☐	1496	Screw Pump
☐	1497	Two Hose Reel
☐	1498	Check Valve
☐	1499	Electric Power Drive
☐	1500	Tank Vents
☐	1501	Powdered Lubricant
☐	1502a	Dissolvers
☐	1502b	Mills
☐	1503	Vacuum Pump
☐	1504	Plastic Cable Clamps
☐	1505	Impulse Steam Trap
☐	1506	Corrosion-resistant Pumps
☐	1507	High-pressure Seals
☐	1508	Steel Unions
☐	1509	Heating Systems
☐	1509A	Boiler Water Purifiers
☐	1510	Refrigeration Units
☐	1511	Electric Heating Mantle
☐	1512	Steam Generator
☐	1513	Industrial Flooring
☐	1514	Butterfly Valves
☐	1515a	Magnetic Separators
☐	1515b	Specific Gravity Separators
☐	1515c	Mechanical Graders
☐	1516	Drum Heater
☐	1517	Cooling Towers
☐	1518	Filter Presses
☐	1519	Tube Pilot
☐	1520	Valves
☐	1521	Air Velocity Meter
☐	1522	Dispetser (state application)
☐	1523	Flat Welding Rings
☐	1524	Retractable Wall
☐	1525	Tinplate
☐	1526	Speed Reducer
☐	1527	Diaphragm Slurry Pump
☐	1528	Hose Clamps
☐	1529	High-temperature V-belts
☐	1530	Insulated Thermocouple Wire
☐	1531a	Electric Heaters
☐	1531b	Applications of Electric Heat
☐	1532	Foot-operated Valves
☐	1533	Package Steam Generators
☐	1534	Acid-handling Pump
☐	1535	Pilot-operated Control Valve
☐	1536	Pressure-leaf Filters
☐	1537	Magnetic Traps
☐	1538	Centrifugals
☐	1539a	Ball and Pebble Mills
☐	1539b	Jar Mills
☐	1539c	Jar Rolling Machines
☐	1540	General-purpose Motor
☐	1541	Vacuum Pumps and Compressors
☐	1542	Purge Meter
☐	1543	Pressure Gage
☐	1544	Portable Vibrators
☐	1545	Hose Coupling
☐	1546	Heat Exchangers and Condensers
☐	1547	Odor Neutralizers (state application)
☐	1548	Positive Displacement Pumps
☐	1549	Steam Generators
☐	1550	Ovens and Dryers
☐	1551	Bale Breaker
☐	1552	Relief Valves
☐	1553	Thermocouples
☐	1554a	Homogenizer
☐	1554b	Colloid Mill
☐	1555a	Bar-stock Valves
☐	1555b	"How to Protect Your Valves"
☐	1556	Electric Steam Generators
☐	1557	Compressed-air Controller and Conditioner
☐	1558	Plastic Pump
☐	1559	Flexible Conduit
☐	1560	Speed Variator
☐	1561	Centrifugal Pump
☐	1562	Dust Filter
☐	1563	Air Compressor
☐	1564	Lubrication Pumps
☐	1565	Temperature Indicator
☐	1566	Teflon Packings
☐	1567	Air Control Valves
☐	1568	Enamel Insulation
☐	1568a	Coolers
☐	1568b	Dryers
☐	1568c	Reactors
☐	1570	Conveyor Dryer
☐	1571	Flexible Pipe Fittings
☐	1572	Strainers & Filters
☐	1573a	Agitators
☐	1573b	Stainless Tanks
☐	1574	Motor Cage Winding
☐	1575	Rotary Pump
☐	1576	Corrosion-resistant Valves
☐	1577	Rotary Pumps
☐	1578	Servomotor-tachometer Generator
☐	1579	Firebrick
☐	1580	Temperture Regulator
☐	1581	Slide Rules
☐	1582	Metal Hose and Expansion Joints
☐	1583	Steam Traps
☐	1584	Saubber
☐	1585	Diethylene Glycol Monoethyl Ether Acetate
☐	1586	Closed-type Pressure Filter
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☐	1588	Liquid and Gas Flowmeter
☐	1589	Adsorbent Activated Carbons
☐	1590	Brine-making System
☐	1591	Polyethylene Glycol Monolaurate
☐	1592	Filters, Lubricators, Regulators and Drain Traps
☐	1593	Engine-gear Set
☐	1594	Metal Grating
☐	1595	Pulverizers (state requirement)
☐	1596a	Chemical Feeders
☐	1596b	Force Feed Lubricators
☐	1597	Safety Poster
☐	1598	Stainless Valves
☐	1599	Chemical Products
☐	1600	Thread Compound
☐	1601	Molybdenum Disulfide Lubricant
☐	1602	Cyclone Separator
☐	1603	Caoutchouc Hydrocarbon Resins
☐	1604	Electrical Terminals
☐	1605	Temperature Indicator
☐	1606	Totally-enclosed Motor
☐	1607	Split-case Metal Packing
☐	1608	Pump
☐	1609	Lift Trucks
☐	1610	Industrial X-rays
☐	1611	Stainless Steel Fittings
☐	1612	Purchasing Guide
☐	1613	Furfural
☐	1614	Itaconic Acid Esters
☐	1615	Packaged Steam Generators
☐	1616	Mercury Relay
☐	1617	Mixer
☐	1618	Controlled-humidity Air Conditioning
☐	1619	Grout Requirements
☐	1620	Protective Closures
☐	1621	Dynamometers
☐	1622a	Water Still
☐	1622b	Water Demineralizer
☐	1623	Fabricating Stainless Tubing & Pipe
☐	1624	Oleates
☐	1625	Gearing
☐	1626	Electrical Insulation
☐	1627	Air Filters
☐	1628	Forged Steel Valves
☐	1629	Tube Gages, Expanders, Cleaners
☐	1630	Titanium Machining
☐	1631	Conveyors
☐	1632	Stainless Utensils
☐	1633	Bag Closing Machine
☐	1634	Vertical Motors
☐	1635	Air Release Valves
☐	1636	Gradiation Heating
☐	1637	Stationary Tachometers
☐	1638	Industrial Oils (state which)
☐	1639	Dust Recovery and Control
☐	1640	Lift Trucks
☐	1641	Adipic Acid
☐	1642	Buckets
☐	1643	Rust Dissolver
☐	1644	Steel Terms and Engineering Data
☐	1645	Thiazol Accelerators
☐	1646	Ball Valves
☐	1647	Wire Cloth
☐	1648	Direct-fired Air Heaters
☐	1649	Flexible Metal Hose
☐	1650	pH Indicator
☐	1651	Butyl Carbitol
☐	1652	Muffle Furnace
☐	1653	Needle Valve
☐	1654	Photometers
☐	1655	Oil Seals
☐	1656	Patents on Polyethylene Polymerization
☐	1657	V-band Coupling
☐	1658	Metal Alloys
☐	1659	Viscosity Controllers
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☐	1661	Piston Packing
☐	1662	Alcohol Solvent Mixture
☐	1663	Plastic Hose
☐	1664	Air-cooled Compressors
☐	1665	Pressure Generator
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☐	1667	Corrosion-resistant Diaphragm Valves
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☐	1673	Primary Amyl Acetates
☐	1674	Processing Equipment
☐	1675	Plastic Gasketing
☐	1676	Corrosion-resistant Wire Cloth
☐	1677	Feed Controller
☐	1678	Gas Flow Recorders
☐	1679	Structural Member
☐	1680	Circulation Heaters (state which)
☐	1681	Rotary Pressure Joint
☐	1682	Research and Engineering
☐	1683	Nickel-clad Steel
☐	1684	Unit Heaters and Blast Coils
☐	1685	Double-ended Pump
☐	1686	Industrial Ventilating Fans
☐	1687	Heat-exchanger Gaskets
☐	1688a	Tube Cleaner
☐	1688b	Tube Cutter
☐	1688c	Tube Expander
☐	1689	Vacuum Pump
☐	1690a	Filter
☐	1690b	Utility Filter
☐	1690c	Disc Filter
☐	1690d	Asbestos Filter Sheets
☐	1691	Clad Steel Equipment
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☐	1695	Submerged Oilless Bearings
☐	1696	Rubber-lined Exhausters
☐	1697	Progressing-cavity Pump
☐	1698	Stainless Fittings & Valves (state which)
☐	1699	Spray Dryer
☐	1700	Stainless Screens
☐	1701	Fans
☐	1702	Roller, Imp, and Cage Mills
☐	1703	Teflon Packings
☐	1704	Dust Collector
☐	1705	Concrete Floor Patch
☐	1706a	Top-entering Mixer, Turbine & Paddle-type
☐	1706b	Top-entering Mixer, Propeller-type
☐	1706c	Side-entering Mixer
☐	1706d	Mixing Data
☐	1706e	Portable Mixer
☐	1706f	Mixing Equipment Line
☐	1706g	Rotary Mechanical Seal
☐	1706h	Laboratory Mixer
	4th Cover	
☐	a	Crude Naphthalene
☐	b	Neutral Oils
☐	c	Plasticizing Oils
☐	d	Rubber Reclaiming Oils
☐	e	Shingle Stain Oils
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THAT'S INTERESTING

(*Continued from page 2*)

"TAXI !!"

Chicago shows joined by helicopter

A scheduled helicopter service, the first of its kind to be used for exposition visitors, shuttled businessmen between downtown Navy Pier and southside International Amphitheater in Chicago, Sept. 6-16.

The expositions involved were the Production Engineering Show (at the Pier) and the Machine Tool Show (at the Amphitheater). More than 100,000 executives attended the events . . . and were able to view the automatic factory of tomorrow while getting an idea on how to beat the traffic of today.

Walking-stick weed killer

"No stoop, no squat, no dig" weed control is likely to become fashionable during dandelion season this year. The back-breaking, knee-wearing poke and pry method may be replaced by an aerosol weed killer with a "walking stick" applicator. This device concentrates lethal 2,4-D spray on a spot about the size of a half dollar. A gentle poke with the stick tip, and the weed ups and dies, roots and all.

Du Pont's Freon is the propellent for this Spot Weed Killer, a product of Bridgeport Brass Co., Dept. CP, 30 Grand St., Bridgeport 2, Conn.

For more information on product at right, specify CP 1706 . . . see information request blank opposite last page.

FERMENTATION at Eli Lilly and Company, Indianapolis, produces erythromycin at high rates. Twelve 200-HP turbine-type LIGHTNIN Mixers achieve maximum gas-liquid contacting effectiveness in antibiotic broth. You can get LIGHTNINs like these, in hundreds of power-speed combinations, sizes 1 to 500 HP, for open or closed tanks.

How Eli Lilly minimizes risk *on large-scale mixing operation*

Mixing fluids in a big way? Then you know how vital it is to *be sure* about results, before you invest.

Eli Lilly's engineers *are* sure. After months of investigation, they selected these twelve 200-HP LIGHTNIN Mixers to speed up fermentation of erythromycin, a wide-range antibiotic, in tanks of 12,000-gallon to 15,000-gallon capacity.

The mixers have performed satisfactorily, as expected, since their installation in 1952.

No guesswork

You can be sure, too. Whatever the mixing operation, with LIGHTNINs you can count on getting the *one* just-right balance of fluid flow and fluid shear that gives you the results you want, with minimum cost.

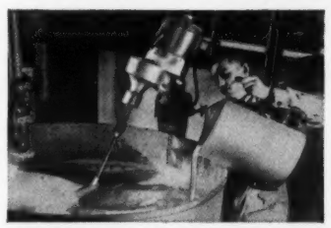
This is because MIXCO engineers are uniquely equipped to pilot-plant your operation, using standard calibrated mixing impellers with *fully-known power characteristics.*

There's no guesswork. Scale-up is accurate. Every LIGHTNIN Mixer is guaranteed, unconditionally, to do the job for which it is recommended.

That's just one reason—and a powerful one—why chemical and pharmaceutical leaders, such as Eli Lilly, more than ever, are standardizing on LIGHTNIN Mixers for *every* fluid mixing operation.

Want to know, specifically, how you can be sure of optimum fluid mixing? Your LIGHTNIN Mixer representative will be glad to show you. His name is in your copy of Chemical Engineering Catalog. Why not phone him today?

USING SPECIAL TANKS? You can get LIGHTNIN Mixers to fit them. Propeller-type units like these, for open or closed tanks, come in 30 models; sizes ¼ to 3 HP.



MECHANIZE your fluid mixing, at low cost, with LIGHTNIN Portable Mixers. Get thorough, uniform mixing in any open vessel. Sizes ⅛ to 3 HP; 30 models.

"Lightnin® Mixers"

MIXCO fluid mixing specialists

Get these helpful facts on mixing: cost-cutting ideas on mixer selection; best type of vessel; installation and operating hints; full description of LIGHTNIN Mixers. Free—no obligation. Just check data you want, tear out and mail to us today with your name and company address.

- ☐ B-102 Top Entering Mixers (turbine and paddle types)
- ☐ B-103 Top Entering Mixers (propeller types)
- ☐ B-104 Side Entering Mixers
- ☐ B-107 Mixing Data Sheet
- ☐ B-108 Portable Mixers (electric and air driven)
- ☐ B-109 Condensed Catalog (complete line)
- ☐ B-111 LIGHTNIN Rotary Mechanical Seals
- ☐ B-112 Laboratory Mixers

MIXING EQUIPMENT Co., Inc., 185-k Mt. Read Blvd., Rochester 11, N. Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 10, Ont.

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Rubber Reclaiming Oils

Tar Acid Oils

Phenothiazine

Shingle Stain Oils

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